Self-reported food safety behaviors in independent ethnic restaurants: An application of the Social Cognitive Theory

by

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B.S., Fayoum University, 2006
M.S., Fayoum University, 2011

AN ABSTRACT OF A DISSERTATION

submitted in partial fulfillment of the requirements for the degree

DOCTOR OF PHILOSOPHY

Department of Hospitality Management
College of Human Ecology

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Abstract

Ethnic foods have gained in popularity and have become mainstream in the diet of most Americans. However, researchers have noted that ethnic food, specifically food served in ethnic restaurants, has been associated with foodborne outbreaks. Little has been done using the Social Cognitive Theory to predict food safety behaviors, especially in independent ethnic restaurants. The purpose of this study was to determine whether self-efficacy, self-regulation, outcome expectations, and environmental determinants are predictive of self-reported food safety behaviors in independent ethnic restaurants.

Utilizing a thorough literature review and results of five focus group and group interviews, a questionnaire was developed. The questionnaire was translated to Chinese and Spanish and back-translated to English to ensure consistency. After pilot-testing, a multistage random sampling technique was utilized to collect data, targeting a total of 150 food handlers from independent Mexican and Chinese restaurants. A total of 204 food handlers responded, but due to incomplete data or responses from non-food handlers, 201 responses were usable for a response rate of 80.4%.

A multiple regression analysis investigated the prediction of food safety behavioral intentions based on the respondents' self-efficacy, self-regulation, outcome expectations, and environmental determinants and found the model was significant ($F = 75.246$, $p = 0.002$). The significant independent variables in the model were self-regulation ($\beta = 0.467$, $p = 0.001$), environmental determinants ($\beta = 0.181$, $p = 0.011$), and outcome expectations ($\beta = 0.152$, $p = 0.018$), which explained about 60.6 % of the variance in food safety behavioral intentions. Self-efficacy was not significant ($\beta = 0.078$, $p = 0.219$). A mediation analysis showed that behavioral intentions are a significant mediator of the relationships between self-efficacy and self-reported

food safety behaviors (*b* = 0.24, CI [0.161, 0.336], self-regulation and self-reported food safety behaviors (*b* = 0.252, CI [0.155, 0.366]), outcome expectations and self-reported food safety behaviors (*b* = 0.355, CI [0.247, 0.469]), and environmental determinants and self-reported food safety behaviors (*b* = 0.269, CI [0.172, 0.393]). Implications, limitations, and direction for future research were discussed.

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Keywords: Social Cognitive Theory, independent ethnic restaurants, self-reported food safety behaviors, ethnic food, food handlers

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Dedication

This is dedicated to the soul of my father, Azmy Saad Boutros, whom I wish he had been with me to witness me grow and succeed. He has been and will continue to be my life-long role model for his hard-work. May God bless his soul.

Chapter 1 - Introduction

Ethnic restaurants are defined as those that serve food from countries other than the traditional cuisine of the host country (Church, Gilbert, & Khokhar, 2006). The demand for ethnic food has grown worldwide in response to the influence of media exposure and overseas food and cultural experiences during travel (Clemes, Gan, & Sriwongrat, 2013).

Ethnic restaurants, especially Chinese, Italian, and Mexican have gained popularity such that they have become mainstream in the diet of most Americans (Agarwal & Dahm, 2015; Lee, Niode, Simonne, & Bruhn, 2012; Liu & Jang, 2009). The National Restaurant Association (2015) has estimated that 80% of consumers eat at least one ethnic meal per month. The ethnic food market continues to grow with Mexican food having the largest market share (62%) (Lee, Hwang, & Mustapha, 2014). The increased interest in ethnic food in the United States (U.S.) has been reinforced by the diverse population, the growing number of immigrants who seek their traditional food, and young people who like to try new and different foods (Niode, Bruhn, & Simonne, 2011; Roseman, Kim, & Zhang, 2013). For instance, Chinese food is one of the leading ethnic foods in the U.S. and there are more than 45,000 Chinese restaurants throughout the U.S. (Chinese American Restaurant Association, 2017). According to Mintel (2012), ethnic food sales in the U.S. reached $3 billion in 2011 and was expected to grow at a 5% to 6% growth rate.

Despite the rapid growth in ethnic foods and the popularity of ethnic restaurants, several researchers have noted that ethnic restaurants have been associated with foodborne outbreaks (Kwon, Roberts, Shanklin, Liu, & Yen, 2010; Lee et al., 2014; Liu & Lee, 2017). Hedberg et al., (2006) noted that 46% of foodborne outbreaks originated in ethnic restaurants. Studies have shown that Asian restaurants tend to violate food safety regulations more frequently than other

ethnic restaurants (Hedberg et al., 2006; Jones, Pavlin, LaFleur, Ingram, & Schaffner, 2004; Kwon et al., 2010). Independent ethnic restaurants were also found to have more critical food safety violations than chain-operated ethnic restaurants (Kwon et al., 2010; Liu & Lee, 2017; Murphy, DiPietro, Kock, & Lee et al., 2011).

Simonne, Nille, Evans, and Marshall (2004) utilized data from the Centers for Disease Control and Prevention (CDC) to investigate foodborne outbreaks due to ethnic food from 1990 to 2000 and found that 43% of outbreaks occurred in restaurants. Lee et al. (2014) found that of 3,474 confirmed outbreaks from 2001 through 2009, 78.4% (2,727) occurred in Mexican restaurants, 9.6% (336) were associated with Italian restaurants, 8.5% (298 cases) originated in Japanese restaurants, and 3.2% (113) were linked to Chinese restaurants.

In a more recent study, Matheus, Franco, Hsu, Marshall, and Simonne (2016), reviewed data from the CDC and previous studies and found that 8.7% (1,529 out of 17,640) of foodborne outbreaks from 1990 to 2008 were linked to Asian, Italian, and Mexican foods, with 60% of these originating in restaurants. The link between ethnic restaurants and foodborne outbreaks has been attributed to the complex food preparation utilized in most ethnic restaurants (CDC, 2011; Mauer et al., 2006), improper food handling, malfunctioning equipment (Fusco et al., 2015), the use of raw or undercooked ingredients (Lee et al., 2014), language barriers (Rudder, 2006; Panchal, Liu, & Dworkin, 2012), limited financial resources especially in independent ethnic restaurants (Agarwal & Dahm, 2015; Phillips, Elledge, Basara, Lynch, & Boatright, 2006), and a culture of food preparation that doesn't comply well with the recommended food safety practices in the United States (Green et al., 2007; Lee et al., 2012).

Statement of Problem

Foodborne illnesses continue to occur, despite all efforts exerted to reduce or prevent them (Almanza & Fisher, 2014). The notion that food prepared away from home is implicated with the occurrence of foodborne illnesses is a sign that foodservice operators need to improve or change food handling practices (Ghiselli, 2014). The Social Cognitive Theory (SCT; Bandura,1986) has been used to explain and predict a diverse set of health behaviors such as smoking cessation (Bektas, Ozturk, & Armstrong, 2010), reducing weight and increasing exercise (Haider, Sharma, & Bernard, 2012), and improving dietary habits (Ahlstrom, 2009; Gaines &Turner, 2009). However, very little research has been done using the constructs of the SCT to predict food safety behaviors, especially in independent ethnic restaurants.

Justification

Many health behavior theories have been used to understand and explain food safety behavior (Hanson & Benedict, 2002; Hinsz & Nickell, 2015; Milton & Mullan, 2012; Roberts & Barrett, 2011). Although models developed in several previous studies based on the Theory of Reasoned Action and the Theory of Planned Behavior have successfully identified numerous factors that affect behavior, they have been criticized for being inadequate in fully explaining behaviors (Ko, 2013; Sniehotta, Presseau, & Araújo-Soares, 2014). Armitage and Conner (2001) conducted a meta-analysis of 161 studies using the Theory of Planned Behavior published between 1985 and 1997 and found that perceived behavioral control and intention explained only 27% of the variance in behaviors while attitude, subjective norms, and perceived behavioral control accounted for 39% of the variance in intention. Hence, a major portion of the variance in behavior is left unaccounted for. Mullan, Allom, Fayn, and Johnston (2014), and Hinsz, Nickell, and Park (2007) recognized the ability of the Theory of Reasoned Action and the Theory of

Planned Behavior models to identify the determinants of behaviors; however, they argued that the models need additional constructs incorporated to improve their power to explain food safety behavior.

The overarching concept of the SCT is reciprocal determinism, which means that a constant interaction exists among the characteristics of a person, their behaviors, and their environment (Gaines & Turner, 2009). The SCT seeks to provide a comprehensive understanding of both why and how people change their health behaviors and the social and physical environments that influence behavior change (McAlister, Perry, & Parcel, 2008). Although it recognizes how environments shape a behavior, this theory focuses on individuals' potential abilities to modify and construct environments to fit specific purposes they set for themselves (McAlister et al., 2008). Thus, a change in one of these factors should affect the others. Since its development in 1986, the SCT has been used widely in the development of health programs and interventions to behaviors (Baranowski et al., 2000; Granner, 2003). In addition, several studies sought to determine whether the SCT constructs influence behavior (Ahlstrom, 2009; Bere & Klepp, 2005). Rimal (2000) stated that factors from social cognition models are important in predicting safe food handling behaviors. For example, in a meta-analysis conducted by Stacey, James, Chapman, Courneya, and Lubans (2015), they indicated that models using the SCT constructs explained 40% to 70% of physical activity behavior in adults. In a study by Beavers, Murphy, and Richards (2015), self-efficacy alone was the only significant predictor of food safety behavior among adolescents and accounted for 42% of the variance in the behavior change.

Purpose

The purpose of this study is to determine whether self-efficacy, self-regulation, outcome expectations, and environmental determinants, as constructs of the SCT, are predictive of self-reported food safety behaviors directly and indirectly through behavioral intentions of food handlers in independent ethnic restaurants.

Objectives

The objectives of this study are:

1. Develop a model using the Social Cognitive Theory that would predict behavioral intentions and self-reported food safety behaviors in independent ethnic restaurants.
2. Design and develop a valid instrument to measure the constructs of the proposed model.
3. Determine if food safety self-efficacy is predictive of food safety intentions and self-reported behaviors.
4. Examine if environmental determinants are predictive of food safety intentions and self-reported behaviors.
5. Determine if outcome expectations are predictive of food safety intentions and self-reported behaviors.
6. Examine if self-regulation is predictive of food safety intentions and self-reported behaviors.
7. Determine if employees' behavioral intentions mediate the relationship between the constructs of the Social Cognitive Theory and self-reported food safety behaviors.

Hypotheses

Accordingly, the following hypotheses were proposed. Figure 1.1 illustrates the hypothesized model.

H_1: Self-efficacy is predictive of food safety behavioral intentions.

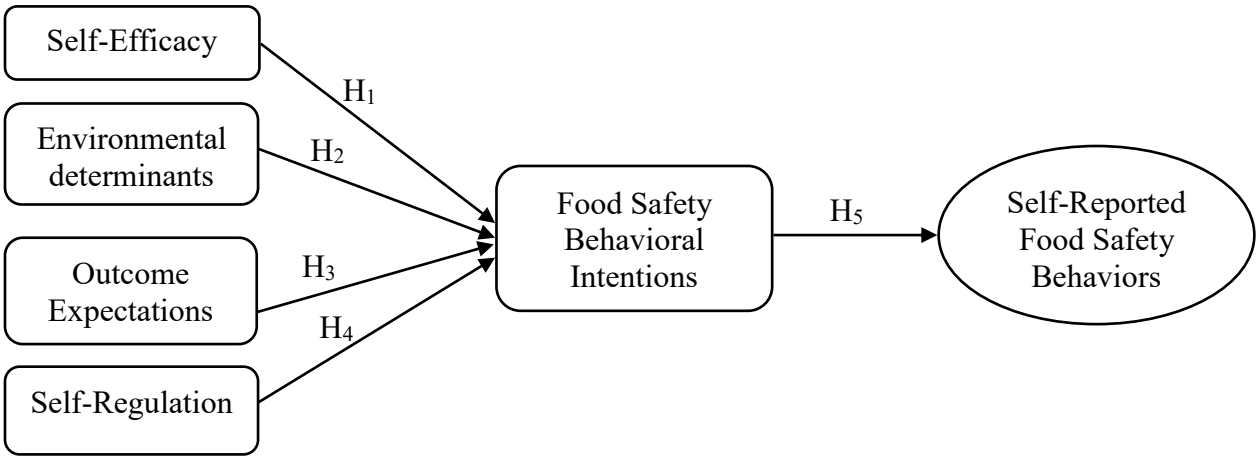
H_2: Environmental determinants are predictive of food safety behavioral intentions.

H_3: Outcome expectations are predictive of food safety behavioral intentions.

H_4: Self-regulation is predictive of food safety behavioral intentions.

H_5: Self-reported food safety behaviors are mediated by food safety behavioral intentions.

Figure 1.1 Conceptual Research Model Using the Social Cognitive Theory



Significance

This study seeks to use the constructs of the SCT, namely, self-efficacy, self-regulation, outcome expectations, and environmental determinants, to predict self-reported food safety behaviors of employees in independent ethnic restaurants in three counties in the state of Kansas. This study is important in expanding our knowledge of the social cognitive constructs that may influence employees' self-reported food safety behavior in independent ethnic restaurants and has a practical value, providing a framework for both theoretical developments and practical interventions.

The SCT has been used in several different settings, but no previous studies have tested if the structural paths of the SCT accurately predict food safety behavior in independent ethnic restaurants. Investigating the predictability of the SCT constructs to food safety behavior in independent ethnic restaurants would be a critical addition to the food safety literature. Such research will aid developers of educational interventions and training programs to more effectively target psychological constructs that will lead to positive food safety practices. This study has also practical implications for public health officials in terms of identifying better ways to communicate positive food safety practices with employees in independent ethnic restaurants.

Limitations

This study utilized a survey and self-reported accounts of behavior. Recent research has supported the significant correlation between self-reported food safety behavior and observed food safety behavior (Milton & Mullan, 2012), however, the use of self-reported data is still a limitation.

Behavior may not be accurately measured because the participants may exhibit recall bias. Steps were taken to mitigate the potential impact of common method biases associated with the cross-sectional self-report method used for identifying food safety behaviors. Procedurally, a variety of scale types and response formats were used throughout the survey instrument. Statistically, Harman's single-factor test was used to diagnose if common method variances exist by investigating whether a single factor can explain most of the variance. The unrotated factor solution of all variables indicated that a single factor did not account for the majority of variance in the variables (40.8%). The computed mean values of all items in the measurement scales were high (4.38 and above), therefore the results should be interpreted with caution and in the context of this study.

The study was conducted in independent Mexican and Chinese restaurants in three counties in the state of Kansas. Therefore, the generalizability of the findings is limited. In this study, data was collected mainly from food handlers whose jobs include food preparation and production. It would be important for future studies to involve other employees like servers who might influence food safety.

The Social Cognitive Theory is broad, therefore to test the theory more fully, different concepts and principles in the SCT need to be measured and manipulated in systematic experiments replicated over diverse behaviors and populations. Future research may need to use different designs (e.g. experimental design) in order to determine the best interventions to promote proper food safety behavior.

Definitions of Terms

Behavioral Intentions: People's judgments about the probability that they will or will not engage in a specific behavior (Hinsz & Nickell, 2015).

Environmental Determinants/Factors: External aspects including social and physical environment that influence a person's behavior (Bandura, 1986, 2002).

Ethnic Food: Food representing heritage and culture of an ethnic group's cuisine and is socially and culturally accepted by consumers in countries other than the respective ethnic group's country (Kwon, 2015).

Focus Group: A group interview, typically involving eight to ten participants who have common backgrounds and led by a trained moderator who works from a set list of questions (Greenbaum, 1998).

Foodborne Illness: An illness that is transmitted to people by food (National Restaurant Association Educational Foundation, 2012).

Foodborne Illness Outbreak: An incident in which two or more individuals undergo a similar illness resulting from the consumption of a common contaminated food (CDC, 2017).

Independent Restaurant: A for-profit foodservice operation operating in at least one location, but fewer than six (Gregoire, 2013).

Ethnic Restaurant: A restaurant that serve food from countries other than the traditional cuisine of the host country (Church, Gilbert, & Khokhar, 2006).

Outcome Expectations: The beliefs about anticipated outcomes of carrying out a behavior (Bandura, 1986, 1999).

Self-Efficacy: The confidence in one's capability to perform a specific behavior (Bandura, 1986).

Self-Regulation: Controlling oneself through self-monitoring, goal setting, and processing information to achieve a goal (Bandura, 1991).

Social Cognitive Theory (SCT): A theory based on the underlying premise that environmental, personal and behavioral factors determine behavior change in a prescribed sequence of operations (Bandura, 1991).

Chapter 2 - Review of literature

The Burden of Foodborne Illnesses: Current Trends

The burden of foodborne illnesses is a problematic public health concern. Scallan et al. (2011) estimated that 9.4 million foodborne illnesses, 55,961 hospitalizations, and 1,351 deaths occur annually in the United States and are caused by 31 known agents. Foodborne outbreaks result in substantial costs to individuals, the foodservice industry, and the economy. The yearly cost of foodborne illnesses, represented in medical costs and productivity losses, were estimated to be over $15.5 billion (Hoffmann, Maculloch, & Batz, 2015). The economic impact of foodborne illnesses on foodservice businesses ranges from damaged brand images to poor financial performance due to lost revenue (Seo, Jang, Miao, Almanza, & Behnke, 2013). Newell et al. (2010) illustrated that multiple factors contribute to the changing trends of foodborne illnesses, including a demographic shift in the aging population of susceptible groups, changing eating habits causing an increase in the consumption of raw or exotic food, and changing farming practices. In spite of this, the Food Marketing Institute (as cited in Lee, 2010), reported that consumers are more confident with the safety of food served in commercial operations (86% in 2009 compared with 43% in 2007), while 20% of them still believe that food safety violations occur most likely in restaurants.

Food Safety and Foodborne Illnesses in Foodservice Operations

Although a foodborne illness outbreak may occur in any setting, it is more likely to occur in a foodservice setting (Fein, Lando, Levy, Teisl, & Noblet, 2011). Previous epidemiological and case control studies provide consistent evidence demonstrating an association between increased frequency of dining in restaurants and increased risk of contracting a foodborne illness

(Bogard, Fuller, Radke, Selman, & Smith, 2013; Green, Khargonekar, & Bushnell, 2013; Green, Selman, Scallan, Jones, & Marcus, 2005).

Restaurants have been identified as recurring places for foodborne outbreaks compared with other settings in the hospitality industry (Jones & Angulo, 2006; Murphy et al., 2011; Osaili et al., 2013). Knechtges (2012) found that approximately 50.1% of foodborne outbreaks reported to the Centers for Disease Control and Prevention (CDC) originated in restaurants or delis, while 16.2% were linked to home meals. Gould, Rosenblum, Nicholas, Phan, and Jones (2013) analyzed data related to foodborne outbreaks reported to the Foodborne Diseases Active Surveillance Network in 2006 and 2007 and found that 66% of the outbreaks originated in restaurants.

Bennett, Walsh, and Gould (2013) reviewed foodborne outbreaks reported to the CDC from 1998 to 2008 caused by *Bacillus cereus*, *Clostridium perfringens*, and *Staphylococcus aureus* and found that 47% of implicated foods were prepared in restaurants or delis. It was estimated that 60% of total foodborne outbreaks were linked to food served in restaurants, followed by catering and banquet facilities (14%), private homes (9%), other commercial locations, such as grocery stores (6%), institutional locations (6%), other locations (3%), hotels or motels (1%), and religious institutions (1%) (CDC, 2015).

Jones and Angulo (2006) attributed the repeated occurrence of foodborne outbreaks in restaurants to their nature of serving a high volume of food and operational factors like low wages, a high turnover rate, and lack of training, as well as behavioral factors such as working while being ill. The Food and Drug Administration's (FDA) report on the occurrence of foodborne illness risk factors showed significant improvement in at least one of the foodborne illness risk factors, however, the percentage of out-of-compliance scores for full-service and fast

food restaurants were higher than hospitals, nursing homes, and elementary schools (FDA, 2010). Full-service and fast food restaurants were found to be 36.16% and 21.68%, respectively, out-of-compliance for major risk factors, which included improper holding temperatures, inadequate cooking, contaminated equipment, poor personal hygiene, and obtaining food from unsafe sources. According to the FDA (2009), full-service restaurants were out-of-compliance for holding time and temperature (54.7%), personal hygiene standards (40.9%), and ensuring sanitary equipment (35%). The percentage of fast-food restaurants out-of-compliance with these risk factors was lower at 38.2%, 24.2%, and 17.4%, respectively.

Although the bulk of food safety research has explored food safety knowledge and training, foodborne outbreaks are still an increasing burden due to poor food safety practices in foodservice operations (Knight, Worosz, & Todd, 2007; Abidin, Arendt, & Strohbehn, 2013). Food handlers can play an integral role to prevent or reduce the occurrence of foodborne illnesses. Greig, Todd, Bartleson, and Michaels (2007) reviewed 816 foodborne outbreaks with 80,682 cases between 1927 and 2006, mostly from the United States, Canada, Europe, and Australia and found that food workers are the most common denominator associated with these outbreaks. Several studies illustrated that improper food handling, improper holding temperature, cross-contamination, and poor personal hygiene are among the leading contributing factors to the occurrence of foodborne illnesses (FDA, 2009; FDA, 2010; Käferstein, 2003; McCabe-Sellers & Beattie, 2004).

Coleman, Delea, Everstine, Reimann, and Ripley (2013) investigated handling practices of leafy vegetables in 439 restaurants in eight U.S. states and noted that about 50% of the received products were exposed to temperature abuse, which could support the growth of pathogens. Brown et al. (2012) examined food cooling practices of restaurant employees in 420

establishments in eight states in the U.S. using data collected by Environmental Health Specialists Network (EHS-Net) and found that 86% of the interviewed managers reported improper cooling practices that do not comply with the FDA recommendations. Handling food by ill or infected workers is another contributing factor to the transmission of foodborne pathogens to diners (Carpenter et al., 2013; Hedberg et al., 2006). Previous research indicated that inadequate resources or supplies, lack of training, lack of reminders, restaurant procedures, and time constraints are among the most frequently reported barriers to performing proper food safety practices (Green & Selman, 2005; Pilling, Brannon, Shanklin, Howells, & Roberts, 2008; York, Brannon, Roberts, Shanklin, & Howells, 2009).

Food Safety in Independent Versus Chain Restaurants

Green et al. (2007) investigated factors related to food worker hand hygiene practices in randomly selected restaurants located in six states in the United States including Colorado, Connecticut, Georgia, Minnesota, Oregon, and Tennessee. Using observational data on 321 food workers and interview data from restaurants managers or owners, they found that proper hand hygiene practices are more prevalent in chain restaurants than in independent restaurants.

Bogard et al. (2013) conducted an observational study to assess ground beef handling practices in eight U.S. states. Using a sample of 385 restaurants, the researchers documented more improper ground beef handling practices occurring in independent restaurants than in chain restaurants. The researchers found that workers in independent restaurants use more subjective measures, such as color and appearance, to determine the end-point cooking temperatures of hamburgers than workers in chain restaurants.

Harris, DiPietro, Murphy, and Rivera (2014) compared the number of critical food safety violations between independent and chain restaurants in seven districts in Florida. Using

inspection records from 2009 to 2011, they found that independent restaurants had more critical violations than chain restaurants in all districts. The authors found that chain restaurants have 26% fewer critical violations than independent restaurants when controlled by district. The authors further explained that the rate of inspection may impact the number of critical violations, with chain restaurants being inspected more often than independent restaurants.

Brown et al. (2014) interviewed restaurants managers to examine the relationship between food safety knowledge and certification. Utilizing a sample of 387 managers, they found that managers' food safety knowledge in chain restaurants was better than their counterparts in independent restaurants. Their results suggested the influential role a manager with good food safety knowledge can play in a workers' food safety knowledge. Gould et al. (2013), Murphy et al. (2011), and Phillips et al. (2006) noted that independent restaurants have more food safety violations, due to the fact that chain restaurants have more financial resources and rigorous food safety standards in place than independent restaurants.

Food Safety in Independent Ethnic Restaurants

In a study to explore restaurant traits linked to foodborne outbreaks, ethnic restaurants were found to be more likely to have outbreaks due to complex food preparation methods used (CDC, 2011). Specifically, a considerable bulk of research illustrated that more critical food safety violations occur in independent ethnic restaurants than in chain ethnic restaurants (Kwon et al., 2010; Liu & Lee, 2017; Murphy et al., 2011; Roberts, Kwon, Shanklin, Liu, & Yen, 2011).

Kwon et al. (2010) reviewed health inspection reports to compare critical and non-critical food safety violations between 500 independent ethnic and non-ethnic restaurants in 14 Kansas counties. They found that independent ethnic restaurants had a significantly higher number of critical food safety violations than independent non-ethnic restaurants.

Liu and Lee (2017) compared differences in food code violations between ethnic and non-ethnic restaurants, as well as independent and chain restaurants, using health inspection data from foodservice operations in Louisiana. Utilizing inspection reports of 769 casual dining restaurants, they found that ethnic restaurants have more violations than non-ethnic restaurants in categories related to time and temperature abuse, cross-contamination, and food condition/surface/labels and that chain restaurants had fewer violations than independent restaurants.

The most frequently reported food safety violations in independent ethnic restaurants were poor time and temperature control, cross-contamination, poor hand hygiene, and poor physical facility maintenance (Kwon, Choi, Liu, & Lee, 2012). The viability of an independent ethnic restaurant as a small business is challenged by its uniqueness as a family-owned ethnic group business (Jones & Fellers, 1999). Most ethnic restaurants are small-scale businesses with limited resources that can be used to improve food safety, especially in independent ethnic restaurants (Liu & Lee, 2017). Liu, Kwon, Shanklin, Canter, and Webb (2014) identified employees' fatigue, learning capability, and financial resources as the top three barriers that impede food safety training in Chinese restaurants. Food safety inspectors' lack of familiarity with the ethnic food (Mauer et al., 2006) and lack of food safety inspection guidelines that are specifically designed for ethnic restaurants (Liu & Lee, 2017) were other barriers to food safety improvement in independent ethnic restaurants.

An ethnic restaurant is a unique environment where ethnic culture of employees mingle with the business culture (Griffith, Livesey, & Clayton, 2010a). This is particularly true with most independent ethnic restaurants being family-owned and operated businesses (Agarwal & Dahm, 2015). Harris, Murphy, DiPietro, and Rivera (2015) noted that foodservice employees in

ethnic restaurants fail to follow proper food safety practices due to the influence of ethnic culture and historical food preparation procedures that do not conform well with food safety guidelines in the U.S. Family members who are involved in an ethnic restaurant operation may pay less attention to food safety codes because of their cultural background and commitment to heritage that seem more important for the success of their operations. Moreover, Matheus et al. (2016) argued that food safety training for handlers in ethnic restaurant would not be effective unless cultural differences are taken into consideration.

Understanding cultural values of ethnic restaurant employees regarding food handling practices is vital in order to fully appreciate the challenges to implementing proper food safety practices in these operations and tailoring food safety training programs that address the cultural misconception of workers (Liu et al., 2014; Niode, Bruhn, & Simonne, 2011). Clayton and Griffith (2008) explored the causes of poor hand hygiene among caterers and suggested that the cause of most foodborne illnesses lie in a poor food safety culture. Guldenmund (2000) stated that an organizational safety culture could shape employees' behavior by acting as a guide that directs their behavior. Neal, Binkley, and Henroid (2012) argued that food safety culture is concerned with promoting proper food safety practices to a standard way of doing business by establishing compliance among all employees. Therefore, efforts to improve food safety in ethnic restaurants need to be focused more on creating awareness, changing behavior, and changing the organizational culture instead of just creating knowledge (Matheus et al., 2016).

Customer Perception of Food Quality and Safety in Ethnic Restaurants

Food quality and authenticity are among the most critical determinants that influence consumers' decisions to dine in an ethnic restaurant (Tsai & Lu, 2012). Food safety as a cue for food quality is important in creating positive perceptions of ethnic restaurants. Liu and Jang

(2009) studied attributes that affect American customers' satisfaction in Chinese restaurants. Using a sample of 315 customers from three casual dining Chinese restaurants, they found that food safety ranked the second most important attribute that influences customer selection of a Chinese restaurant. The researchers also found that food safety has a significant impact (β = 0.130, $p < .001$) on customer satisfaction and dining experience. This is especially important for customers who are not familiar with ethnic foods and perceive them as risky.

Jang and Kim (2015) investigated the perceived risk of ethnic food by U.S. customers and found that food neophobia is a major barrier that makes customers avoid trying ethnic food. Lee, Niode, Simonne, and Bruhn (2012) similarly investigated consumer perception and attitude to food safety in Asian and Mexican restaurants in the U.S. and revealed that respondents trust food safety in Mexican restaurants more than in Asian restaurants, possibly due to consumers familiarity with Mexican cuisine.

Kim, Lee, and Yoon (2012) explored factors affecting consumers' choice of Korean food in the United Kingdom (U.K.). Using a self-administered questionnaire with 170 respondents and ten face-to-face interviews, the researchers found that there was a significant difference between genders regarding food neophobia, with males having a higher tendency to try new foods than females. In addition, older consumers were less likely to revisit Korean restaurants, as they were influenced by healthy food options and taste. In addition, sanitation procedures are prone to be questioned by customers unfamiliar with certain ethnic food or preparation methods and thus, patronage and success of an ethnic restaurant may be affected (Agarwal & Dahm, 2015). Therefore, independent ethnic restaurants face a unique challenge to maintain and comply with proper food safety practices, especially given that perceptions of food safety have a

significant impact on customers' choice of restaurant and continued patronage (Henson et al., 2006).

Food Safety Behavior: Measurement and Intervention Strategies

The behaviors of foodservice workers are crucial for providing safe food. Foodservice employees are the last line of defence for safety prior to serving the customer. Several studies have reported that improper food handling practices, including poor personal hygiene, inadequate cooking, improper holding temperature, and contaminated equipment were the most significant contributing factors to foodborne illness in foodservice establishments (Bean, Goulding, Lao, & Angulo,1996; FDA, 2009). Food safety training and regulatory inspections have been the two fundamental methods used to mitigate the risk of foodborne diseases in foodservice operations, however, previous contributing factors to foodborne disease are behaviors that need to be changed (Green, 2008). Improving food safety requires shifting the focus from traditional approaches of training and inspection to understanding and changing food safety behavior (Powell, Jacob, & Chapman, 2011).

The importance of food safety knowledge and training has been highlighted in previous research. Osaili et al. (2013) evaluated food safety knowledge of 1,084 food handlers in 297 fast food restaurants in Jordan. They found that food workers who completed a food safety training course had higher overall food safety knowledge scores than those who did not complete. In a similar study, Lynch, Elledge, Griffith, and Boatright (2003) compared food safety knowledge of restaurant managers in Oklahoma based on whether a food safety training had been received. Using a sample of 1,000 restaurant managers, they found that food safety knowledge scores were high among respondents who received a formal training compared with those who had no formal training.

Even though food safety knowledge is an essential component of promoting food safety behavior, numerous studies indicated that it is not always sufficient to guarantee behavior change (Angelillo, Viggiani, Rizzo, & Bianco, 2000; Brannon, York et al. 2009; Clayton, Griffith, Price, & Peters, 2002; Green, 2008; Pilling, Brannon, Shanklin, Howells, & Roberts, 2008). Angelillo et al. (2000) evaluated food safety knowledge, attitude, and behavior of food handlers in Italy. Using a sample of 411 food handlers and a structured face-to-face interview, they found that the respondents' attitude and knowledge were not supported by some of their self-reported behaviors as only 20.8% reported using gloves and 68.7% reported washing their hands before handling food.

Clayton et al. (2002) examined beliefs of food handlers towards food safety and their self-reported practices. Utilizing a sample of 137 food handlers from 52 small to medium-sized foodservice businesses, they found that 63% of the respondents admitted not always using the food safety practices they know they should implement, including handwashing, prevention of cross-contamination, maintaining good personal hygiene, and temperature control.

In a nationwide study, Byrd-Bredbenner, Maurer, and Wheatley (2007), explored self-reported food safety behaviors and knowledge of young adults. They surveyed a total of 4,343 persons and found that participants answered 60% of the food safety knowledge questions correctly, however, they failed to perform these practices.

Pilling, Brannon, Shanklin, Roberts, Barrett, and Howells (2008) evaluated the effectiveness of mandatory food safety training by comparing food safety knowledge and behavior between restaurants that have shift managers knowledgeable about food safety and restaurants that are required to have all food handlers trained. Utilizing a sample of 242 foodservice employees, they found that having all food handlers trained does not consistently

ensure improved knowledge or behaviors. The researchers highlighted the importance of identifying barriers to following proper food safety behaviors.

Green (2008) explained that food safety behavior is complicated and several interconnecting factors including attitudes, beliefs about the behavior, intentions, and perceived barriers influence the engagement in a specific behavior and not just knowledge, solely. Rennie (1995) and York et al. (2009) argued that models developed based on the assumption that improved knowledge is the main precursor to food safety behavior change are flawed because they ignored other cultural, social, and environmental factors that may influence the behavior. Therefore, the use of a comprehensive theory that incorporates the aforementioned factors is critical to understand food safety behavior. Nieto-Montenegro, Brown, and LaBorde (2006) elucidated that health behavior theories provide frameworks to understand individuals' beliefs and workplace factors that influence workers' behavior and identify trouble spots for which educational materials can be developed. Previous studies to predict and explain safe food handling behavior generated inconsistent results due to investigating food safety behavior in general rather than considering factors that may influence each of the different behaviors separately (Mullan, Allom, Sainsbury, & Monds, 2015).

Although observational studies can avoid the shortcomings of self-reported food safety behavior due to difficulty in recalling information and social desirability bias, they are more expensive and logistically hard to conduct (Mullan & Wong, 2010; Kwon, Roberts, Sauer, Cole, & Shanklin, 2014). Previous research reported mixed results regarding the magnitude of difference between self-reported and actual food safety behavior. For example, Dharod et al. (2007) conducted a comparison between self-reported and observed food safety behaviors among a group of 60 individuals preparing meals at home. They found that the contrast between

reported and observed behaviors varied across food handling and sanitation practices, especially hand washing, thawing, and using a thermometer. Similarly, DeDonder et al. (2009) compared observed and self-reported food handling behavior of a group of home meal preparers. Utilizing a convenience sample of 41 individuals, their study revealed a discrepancy between observational and self-reported handwashing behavior and the use of a thermometer.

On the other hand, a recent study by Milton and Mullan (2012), using a sample of 45 college students, found that self-reported and observed food safety behavior were significantly correlated. Therefore, it is clear that the advantage of measuring food safety behavior through self-reported or observational data is relatively context-based.

For better investigating and measuring food safety behavior, Mullan, Wong, and O'Moore (2010) emphasized the importance of implementing interventions that target individuals' understanding of specific food safety behaviors, rather than general safe food handling behavior. Food safety interventions may take different forms, including policies, enforcement, and education to reduce the potential risks of foodborne illnesses (Lee, 2013). Milton and Mullan (2010) conducted a systematic review of food safety interventions in 10 studies related to domestic food safety and found that educational or psychosocial interventions led to an increase in self-reported food safety behaviors, while their influence on observed food safety behavior and knowledge was inconsistent. The authors argued that many of the reviewed studies lost their methodological strength due to developing interventions based on constructs from merely theoretical models that were not applied.

Kretzer and Larson (1998) examined several behavioral theories like the Health Belief Model, Theory of Reasoned Action, Theory of Planned Behavior, and the Transtheoretical Model and argued that they focused primarily on personal factors and ignored the effect of the

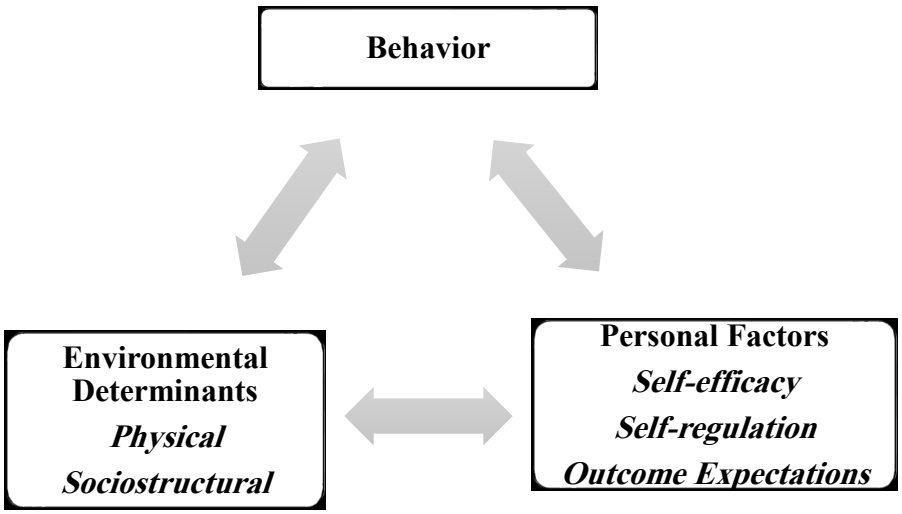
organizational context on behavior change. According to Kretzer and Larson (1998), theoretically-based interventions should follow a holistic approach by considering organizational factors, as well as individual factors, to effectively influence behavior change. Michie, Stralen, and West (2011) illustrated that understanding a behavior in its context is the primary step for designing interventions. Averett, Nazir, and Neuberger (2011) used a quasi-experimental design to measure the impact of a mandatory food handler training program on the rates of total and critical violations in foodservice establishments in Kansas before the training from 2001 through 2004 and after training for 2005 through 2007. After implementation of the training program, they found the number of critical violations unrelated to food handler behavior decreased (24.7%) more than behavioral violations (4.9%), suggesting that there were other structural or environmental factors unaccounted for by their analysis. Therefore, an effective food safety behavior intervention needs to target social, behavioral, and work-environment barriers to proper food safety behaviors.

The Social Cognitive Theory

The Social Cognitive Theory (SCT) is based on the underlying premise that environmental, personal, and other behavioral factors interact to influence one another in a bidirectional process that is termed as triadic reciprocal causation (Bandura, 1999). Specifically, Font, Garay, and Jones (2016) elucidated that an individual's behavior is determined by the environment and personal characteristics. The researchers further indicated that personal characteristics are formed by behavior and that behavior and personal characteristics influence a person's environment. Bandura (1986) indicated that the core set of determinants of the SCT includes self-efficacy, which refers to confidence in one's ability to perform a behavior; outcome expectations regarding the expected consequences of a behavior; self-regulation, which refers to

the goals individuals set for themselves and the plans and strategies for achieving them, and the perceived social and structural impediments to performing a behavior. Thus, the SCT posits that individuals perform a behavior if they perceive control over the outcome of the behavior, few external barriers, and confidence in their own ability (Armitage & Conner, 2000). Figure 2.1 represents a schematic representation of the reciprocal determinism between the three classes of determinants in the SCT.

Figure 2.1 A Scheme of the Reciprocal Causation Relationship between the Three Determinants of the SCT



Kwasnicka, Dombrowski, White, and Sniehotta (2016) conducted a systematic review of 100 behavior theories to identify the theoretical explanations for behavior change maintenance. Using a panel of 40 behavior change theory experts, the researchers found that the SCT is among the most relevant theories to behavior change maintenance, which relates to persistent performance of the behavior. The importance of the SCT lies in enabling researchers to understand the process by which individuals acquire and perform certain behaviors and

providing the basis for intervention strategies (Bandura, 2004). McAlister et al. (2008) illustrated that the significance of the SCT has come from its application in the design of interventions targeting challenges to behavioral change in medicine and public health. For instance, the constructs of the SCT were used to predict and design interventions to a wide variety of behaviors as shown in Table 2.1.

Table 2.1 Summary of Studies Using the Social Cognitive Theory to Understand Various Behaviors

Study	Topic
Ahlstrom (2009)	College students' fruit and vegetable intake
Anderson-Bill, Winett, and Wojcik (2011)	Nutrition and physical activity
Castellanos, Keller, and Majchrzak (2016)	Dietary intake of fruit and vegetable
Zhou (2015)	Nutrition, handwashing, oral Hygiene, sun protection, face mask use, and physical activity
Ellis, Brown, Ramsay, and Falk (2016)	Nutrition and physical activity
Haider, Manoj, and Amy (2012)	Predicting exercise behavior
Lin and Hsu (2015)	Consumer's green behavior
Lubans et al. (2012)	Dietary intake of adolescent girls
Ojeda, Flores, and Navarro (2011)	Students' academic and life satisfaction
Sener and Cimete (2016)	Maternal self-efficacy and child behavior
Yazdanpanah, Feyzabad, Forouzani, Mohammadzadeh, and Burton (2015)	Farmers' water conservation behavior

Some studies used sole constructs of the SCT in the food safety area like self-efficacy (Beavers et al., 2013; Brandon, 2010; Byrd-Bredbenner, Maurer, & Wheatley, 2007; Richards & Beavers, 2014). The following sections will review the four major constructs of the SCT that have been commonly used to investigate several health behaviors.

Self-Efficacy

Self-efficacy is considered a pivotal determinant of behavior that stands for confidence in one's capability to perform a specific behavior (Bandura, 1986) and is often the principal focus

of research attention. According to Bandura (1977, 1986), individuals with greater perceptions about their own abilities are more likely to perform challenging behaviors compared to those with low self-efficacy perception. As such, if a person has low self-efficacy they are more likely to perform improper behaviors that result in compromising food safety, whereas a person with high self-efficacy will engage in proper food safety practices and takes precautions to avoid risky behaviors. Mitchell, Fraser, and Bearon (2007) pointed out that self-efficacy, as related to an individual's perception of their capability to engage in a behavior, influences the level of effort in performing that behavior. Therefore, this study defines food safety self-efficacy as the confidence in one's capabilities to perform proper food safety practices (Abbot, Byrd-Bredbenner, Schaffner, Bruhn, & Blalock, 2009; Byrd-Bredbenner, Maurer, & Wheatley, 2007). Food safety self-efficacy can also be termed as the internal behavioral control expressed in the easiness/difficulty of performing a food safety behavior (Clayton & Griffith, 2008).

Previous research has established that self-efficacy is the most important prerequisite for behavioral change and that it is a construct that mediates cognition and an individual's behavior (Young, Lipowski, & Cline, 2005). Graham and Weiner (1996) contended that self-efficacy has been proven to be a more consistent predictor of behaviors than any other motivational construct, such as locus of control. Bearth, Cousin, and Siegrist (2014) conducted a longitudinal intervention study to investigate novice cooks' self-reported cross-contamination avoidance behavior using the Health Action Process Approach at three-time intervals. The researchers developed a model which differentiated between two phases of behavior change: a motivational and a volitional phase. In the motivational phase, the researchers postulated that intention to change the behavior is predicted by motivational self-efficacy, outcome expectancies, perceived vulnerability and severity, and risk awareness. In the volitional phase, the researchers presumed

that intention is activated through planning and volitional self-efficacy that constitutes coping and recovery aspects of behavior change. Utilizing a sample of 289 university students, they found that volitional self-efficacy and planning explained additional variance of the follow-up behavior after implementing the intervention.

Beavers et al. (2013) studied food safety self-efficacy of adolescents. Utilizing a stratified random sample of 217 middle school students, the researchers developed and validated an instrument to measure food safety self-efficacy. The researchers argued that understanding the influence of food safety knowledge and self-efficacy on food safety behavior can help to ensure that behavioral interventions are designed to promote and maximize sustainable positive behavior changes. Similarly, Beavers et al. (2015) investigated the impact of an educational intervention on food safety self-efficacy of adolescents and the relationship between their self-efficacy and subsequent food safety behavioral change. Using a sample of 424 students across six states, they found that there was a strong correlation ($r = 0.68$) between the students' self-efficacy and their self-reported food safety behavior after implementing the curriculum intervention.

Quick, Byrd-Bredbenner, and Corda (2013) examined the determinants of food safety behavior among middle school youth. They collected data using an online questionnaire from 1,102 middle students and found that food safety self-efficacy, attitudes, and behavioral intentions were key determinants of handwashing behavior. Although the previous studies were conducted in non-foodservice operations, they reflected the influence of one's self-efficacy on food safety behavior. Self-efficacy was also found to influence career commitment of foodservice employees (Niu, 2010). Moreover, Montaño and Kasprzyk (2008) argued that self-efficacy is a predictor of intention and its subsequent behavior.

Richards and Beavers (2014) argued that the level of one's food safety self-efficacy does not necessarily indicate that this person will demonstrate safe food handling behavior and that interventions are needed to improve food safety knowledge side-by-side with self-efficacy. For example, foodservice employees may believe that handwashing will prevent foodborne illness, but they may have low levels of confidence in their ability to carry out this behavior. Abbot et al. (2009) compared food safety cognitions and self-reported food safety behavior with observed behavior. Utilizing a sample of 432 university students, they found that although respondents had a high-level of self-efficacy and overall high food safety knowledge, they demonstrated poor observed handwashing, cross-contamination prevention, temperature control, and thermometer use behaviors. It should be noted however, that these studies used cross-sectional data and didn't measure other social cognitive constructs that may influence the behavior like outcome expectations.

Outcome Expectations

Outcome expectations have been defined as the beliefs about anticipated outcomes of carrying out a behavior (Bandura, 1986, 1999). The SCT and several other health behavior models and theories give special consideration to outcome expectations. According to McAlister et al. (2008), outcome expectations correspond to the concept of social norms in the Theory of Reasoned Action and the Theory of Planned Behavior. Bandura (2004) argued that outcome expectations take several forms, including physical, social, and self-evaluative outcome expectations. Physical outcome expectations are pleasurable and aversive effects of the behavior and the accompanying losses or benefits. Social outcome expectations are the social approval or disapproval that the behavior creates in one's interpersonal relationships. Self-evaluative outcome expectations are the positive and negative self-evaluative reactions to one's behavior.

Thus, behavior can be governed partly by people's anticipation of how they will feel about themselves if they do or do not perform a certain behavior (McAlister et al. 2008).

Outcome expectations were a key construct in several studies to understand various behaviors. Dewar, Lubans, Plotnikoff, and Morgan (2012) used a mixed-method approach to design and evaluate a scale to measure adolescents' dietary behavior with the SCT. Using a sample of 173 students, they identified the validity of the scale and found that outcome expectations were associated with healthy eating behaviors in adolescents. Similarly, Doerksen and McAuley (2014) found that outcome expectations were a significant positive independent predictor of change in both fruit and vegetable and low-fat food consumption.

Armitage and Conner (2000) indicated that for individuals who lack direct experience of the behavior, outcome expectations may directly impact behavioral intentions. In the context of food safety behavior, employees' beliefs regarding the outcomes of proper food safety behavior may influence how they adhere to proper practices. Roseman and Kurzynske (2006) investigated the relationship between consumers' food safety risk perception and behavior. In their sample of 728 consumers in Kentucky, they found that individuals who perceived greater susceptibility to food safety risks reported to follow proper food safety behavior. Their findings suggest that outcome expectations regarding the beliefs and perception of potential risks of poor food handling behavior may stimulate behavioral change. Howells et al. (2008) indicated that educating food handlers on the consequences of improper practices might improve their attitude towards food safety. Hence, unless employees' expectations supports that a specific food safety behavior makes a difference in the safety of the food served, their attitude and belief about the behavior will be negative (Ball, Wilcock, & Aung, 2010).

According to Lent, Ireland, Penn, Morris, and Sappington (2017) self-efficacy and outcome expectations are considered as central cognitive motivators that enable performing a behavior. Mitchell and Fraser (2011) evaluated parents' self-efficacy, outcome expectations, and self-reported disease management tasks for their afflicted children. In their convenience sample of 120 parents, they revealed that parents' self-efficacy and outcome expectations had a significant influence on self-reported practices of disease management. Tudoran, Scholderer, and Brunsø (2012) examined the influence of interaction between self-efficacy and outcome expectations of individuals on their healthy eating behavioral intention. Using two random samples of 959 and 2,400 individuals, they found that prevention outcome expectations in terms of avoidance of negative consequences of a behavior had a significant interactive effect with self-efficacy on the intention to consume two healthy food products.

Self-Regulation

Self-regulation refers to controlling oneself through self-monitoring, goal setting, and processing information to achieve a goal (Bandura, 1991). Even though self-efficacy, social support, and outcome expectations are necessary determinants for performing a behavior in the SCT, Bandura (2005) suggested that self-regulation is also essential to sustain the behavior. Zimmerman (2000) showed that self-regulation encourages the initiation and maintenance of goals and achievement of greater satisfaction and prevent behaviors that are considered inconsistent with one's goals. Therefore, self-efficacy and outcome expectations are posited to influence behavior directly and through the development and use of self-regulation (Bandura, 1997).

Self-regulation was found associated with change in several behaviors including exercise behavior (Ahn, Jeon, & Kwon, 2016), diet behavior (Anderson, Winett, Wojcik, & Williams,

2010), and physical activity in cancer patients (Ungar, Sieverding, Weidner, Ulrich, & Wiskemann, 2015). Anderson, Winett, and Wojcik (2007) found that older adults exhibited healthier fiber, fruit, and vegetable intake in part because they were more likely to use self-regulation strategies in terms of how well they set goals, plan, and monitor their diet. Lin and Hsu (2015) also found that self-regulation played an integral role along with self-efficacy in creating conditions conductive to green consumer behavior. As in the case with the constructs of the SCT, interventions based on the concept of self-regulation were found effective in targeting health behaviors. Tougas, Hayden, McGrath, Huguet, and Rozario (2015) conducted a systematic review of literature in 35 articles and identified that the Social Cognitive Theory of self-regulation provided an adequate and feasible framework for developing interventions for some chronic health conditions.

Bandura (1997) identified six ways in which self-regulation is achieved: (a) self-monitoring is a person's systematic observation of their own behavior; (b) goal-setting is the identification of gradual and long-term changes that can be achieved; (c) feedback is information about the quality of performance and how it can be improved; (d) self-reward is a person's provision of tangible or intangible rewards for themselves; (e) self-evaluation occurs when individuals self-evaluate themselves before and during the performance of a behavior; and (f) enlistment of social support is achieved when a person finds people who encourage their efforts to exert self-control. Previous research clarified the unique role of self-regulation in influencing and predicting a behavior. Hall and Fong (2007) argued that repetitive health behaviors that are easy to self-control are a function of both past behaviors represented in habits and self-regulation. Mullan and Wong (2009) investigated food handling behaviors using the Theory of Planned Behavior. Utilizing a sample of 109 college students, they found that the theory

predicted 39% of variance in self-reported behavior and suggested that adding the self-regulation construct may improve the predictive power of the theory. Hall, Fong, Epp, and Elias (2008) investigated the addition of self-regulation variable to the Theory of Planned Behavior in explaining exercise and diet behaviors. Using a sample of 64 undergraduate students, they found that individual differences in self-regulation explained a significant proportion of variance in exercise behavior (59%) and dietary behavior (61%) which is double the variance in health behaviors explained by the TPB in similar previous research.

Environmental (Socio-structural) Determinants

Environmental determinants or factors stand for external aspects that influence a person's behavior (Bandura, 1986). According to the SCT, the importance of these environmental determinants lies in that behavior change will not occur unless the social and physical environment uphold the new behaviors (Bandura, 2002). In addition, Yazdanpanah et al. (2015) stated that the SCT assumes that a person's actual behavior in performing a certain action is primarily guided by their behavioral goals and by possible environmental facilitators and impediments. Many studies indicated the importance of environmental determinants in reinforcing and changing behaviors like physical activity and food choice (French, Story & Jeffery, 2001; Popkin, Duffey, & Gordon-Larsen, 2005). McAlister et al. (2008) and Ahlstrom (2009) elucidated that environmental determinants can be diverse as resources, structures, or physical conditions that make behaviors easier to perform.

Previous research highlighted the role that physical and social environment play in supporting the adoption of safe food handling behavior (Quick et al., 2015). Inadequate financial resources or supplies have been frequently cited as some of the barriers to ensure safe food handling practices in foodservice operations (Giampaoli, Cluskey, & Sneed, 2002; Sneed &

Henroid, 2007). York et al. (2009) investigated restaurant employees' beliefs about food safety using a mixed-method approach. Utilizing a sample of 34 food handlers, they found that inconveniently located resources were among the most frequently reported barriers to handwashing. Strohbehn et al. (2014) assessed the perception of nonsupervisory foodservice employees of barriers and motivational factors that influence their food safety behavior. In their sample of 1,103 foodservice employees at 100 foodservice operations in the U.S., they found that lack of supplies like gloves and alcohol wipes was a major barrier to performing proper food safety behaviors. The researchers suggested that managers need to improve the work environment by making supplies available and accessible to ensure improving employees' food safety practices. Quick, Byrd-Bredbenner, and Corda (2013) suggested that future research should investigate the impact lack of resources and time as impediments or facilitators may have on food safety behavior. Mitchell et al. (2007) also argued that interventions to food safety behavior are more likely to be effective if they target environmental and contextual factors represented in providing accessible necessary resources, social support, and supportive organizational policy to proper food safety practices.

The environmental determinants or facilitators can be social/interpersonal as well. Anderson et al. (2007) investigated nutrition behavior using the constructs of the SCT. Utilizing a sample of 712 churchgoers, they found that family social support made an important contribution to participants' healthy eating behavior regarding lowering fat consumption (β = -0.38, $p < 0.001$), increasing fiber intake ($\beta = 0.36$, $p < 0.001$), and increasing fruits and vegetables intake ($\beta = 0.37$, $p < 0.001$). From a food safety perspective, Howells et al. (2008) examined barriers to perform proper food safety practices and inferred that managerial support in terms of encouraging employees and giving them verbal reminders and praise for following

proper practices may have a significant impact on their behavior. Griffith, Livesay, and Clayton (2010a), showed that environmental support as a component of the organizational culture can help promote proper food safety behavior. Green and Selman (2005) investigated factors that impact food workers' ability to perform proper food safety behaviors. They conducted 11 focus groups with 70 managers and foodservice workers and identified several factors that influence the participants' food safety behavior including structural environment and management/co-worker emphasis. Another form of environmental determinants to modify behavior according to (Bandura, 1986) is incentive motivation through the provision of rewards or punishments for approved or unapproved behaviors. For instance, Griffith, Livesay, and Clayton (2010b) indicated that the concept of rewards for hygienic behavior is associated with motivation to behave hygienically.

Behavioral Intentions

Abraham, Sheeran, and Johnston (1998) and Sheeran (2002), elucidated that intention encompasses an individual's motivation and willingness to perform a behavior and it is an essential construct of health behavior models using the Theory of Planned Behavior and the Social Cognitive Theory. Hinsz and Nickell (2015) defined intentions as people's judgments about the probability that they will or will not engage in a specific behavior. Bandura (1986) argued that most behaviors are mediated or guided by behavioral goals or intentions. Furthermore, Bandura (2004) proposed the structural paths of the SCT, whereby perceived self-efficacy is hypothesized to influence health behavior both directly (i.e., a pathway exists from self-efficacy to the behavior) and indirectly, through its effect on goals, outcome expectations, perceived barriers, and facilitators. According to Bandura's (2004) proposed model for the indirect pathway of the social cognitive constructs, intentions can mediate the relationship

between self-efficacy, outcome expectations, environmental factors in terms of barriers/impediments and the health behavior. Thus, intentions can be considered the direct precursor of behavior. Montaño and Kasprzyk (2008) stated that a specific behavior is most likely to be performed if a person has a strong intention, sufficient knowledge and skill to do it in a constraints-free environment.

Previous research highlighted the importance of behavioral intention in influencing food safety behavior and knowledge. Pilling, Brannon, Shanklin, Howells, and Roberts (2008) examined the influence of the constructs of the Theory of Planned Behavior on restaurant employees' intentions for performing food safety behaviors. Utilizing a sample of 190 foodservice employees from three Midwestern states, they found a significant difference ($P < 0.001$) between employees' level of intention and beliefs about food safety behaviors.

Mullan, Wong, and Kothe (2013) investigated the use of an extended model using the Theory of Planned Behavior in predicting hygienic food handling behavior of adolescents recruited from the U.K. and Australia. Utilizing a sample of 205 students, the results showed that perceived behavioral control and intention explained an additional 24% of the variance in behavior. Yazdanpanah et al. (2015) examined factors influencing water conservation intention and behavior using the constructs of the SCT. Using a stratified random sample of 360 farmers, they found that farmers' behavioral intention only had a positive relationship with the behavior. In addition, their findings showed that self-efficacy had a strong indirect effect on the behavior through behavioral intention. Ghezzi (2017) investigated food safety knowledge and training of food truck managers/owners using the Social Cognitive Theory. Using a mixed-method approach and a sample of 271 food truck managers/owners, the researcher found that behavioral intention

was the most significant ($\beta = 6.43$, $P < 0.001$) determinant of respondents' overall food safety knowledge score.

Conclusion

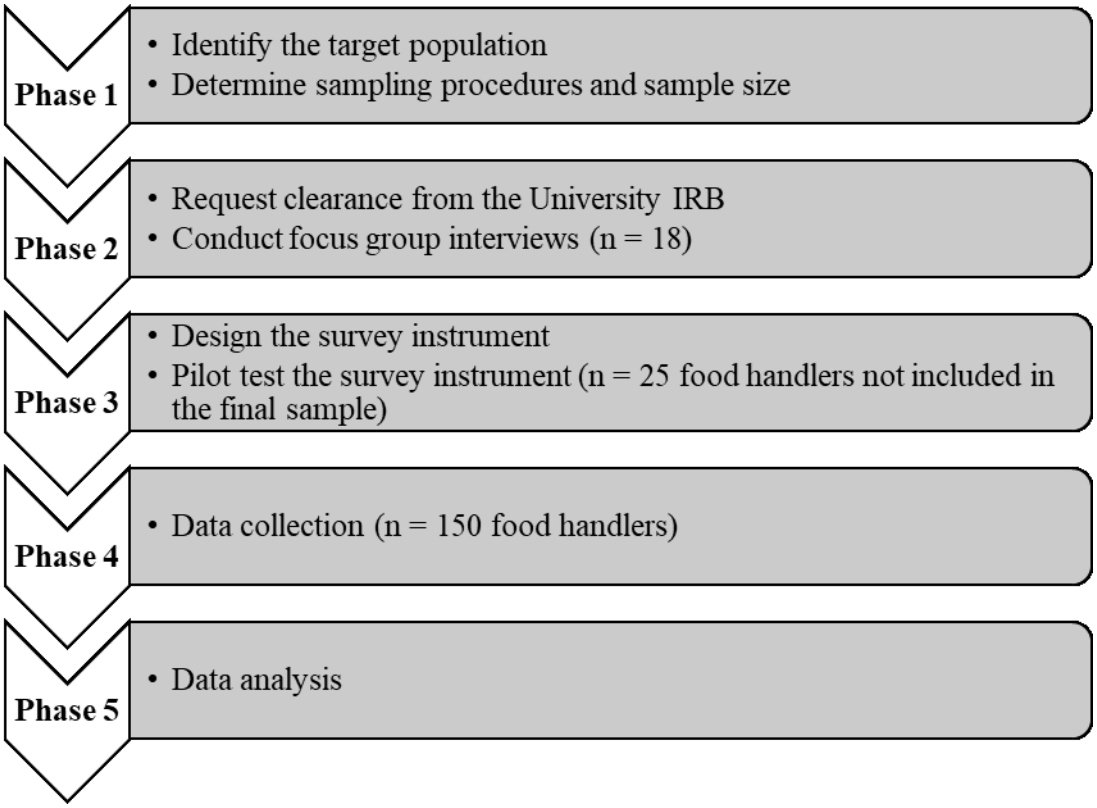
Foodborne illnesses constitute a public health issue in the U.S. While a foodborne illness may occur in any setting, previous research provided consistent evidence demonstrating an association between increased frequency of dining in restaurants and increased risk of contracting a foodborne illness. Specifically, previous research has established that independent ethnic restaurants experience more food safety violations compared with chain ethnic restaurants due to being small-scale businesses with limited resources and poor food handling practices. Several studies concluded that increasing food safety knowledge does not necessarly guarantee behavioral change and that the baseline for improving food safety is changing behavior and promoting a culture of food safety. Although several health behavior theories have been used to understand food safety behavior and to develop intervention strategies, they have been criticized for being inadequate to fully explain food safety behavior. The Social Cognitive Theory has been used in different settings to understand various behaviors ranging from dietary behavior, physical activity, and sustainable behavior. However, it has been rarely used to predict food safety behavior especially in independent ethnic restaurants. The importance of the Social Cognitive Theory lies in its utility to account for psychological and environmental constructs that have not been accounted for by other theories like the Theory of Planned Behavior or the Theory of Reasoned Action.

Chapter 3 - Methodology

Introduction

This chapter presents the research design, sampling, focus group, survey instrument design, data collection, and data analysis procedures utilized to accomplish the research objectives. The purpose of this study was to determine whether self-efficacy, self-regulation, outcome expectations, and environmental determinants as constructs of the SCT are predictive of self-reported food safety behaviors in independent ethnic restaurants. Figure 3.1 shows a flow chart of the research procedures.

Figure 3.1 Research Plan



Study Design and Sampling

To gain a broader or more complete understanding of food safety behaviors, which are complex and hard to investigate accurately with one approach, this study followed a sequential mixed-method approach using focus group and group interviews and a survey instrument. The combination of both qualitative and quantitative approaches enabled the researcher to elaborate on the findings of the qualitative method with a quantitative method (Creswell, 2009).

A multi-stage random sampling technique was utilized to collect data for the main study. Data was collected by the researcher on-site, therefore, a cluster sample of independent ethnic restaurants (30 restaurants) was drawn from Johnson, Shawnee, and Sedgwick counties in Kansas. These counties were selected, as they are the most densely populated with independent ethnic restaurants in the state.

In this study, independent ethnic restaurants are defined as independently-owned restaurants that serve foods in a host country representing a heritage and culture of an ethnic group who use their knowledge of ingredients of plants and/or animal sources (Kwon, 2015). A list of commercial foodservice establishments licensed to sell food was obtained from the licensing body in the state. All chain restaurants were purged from the list, resulting in 555 restaurants (Division of Food Safety and Lodging, Kansas Department of Agriculture, 2016). Further cross-checking was done on the websites of the restaurants to determine whether a restaurant was an independent Chinese or Mexican restaurant. To ensure consistency, Chinese or Mexican restaurants that operate in hotels, grocery stores, or clubs were not included. Any independent Chinese or Mexican restaurant from which employees were selected for the focus group, group interviews, or pilot study was removed from the database prior to selecting the restaurants. The sample estimated to achieve a 95% confidence interval based on the number of

constructs under investigation was 138 employees using G*Power (version 3). To allow for dropouts, 150 employees were targeted. However, to check for the measurement scales validity, the target sample was increased to 250 employees for data collection.

Focus Group and Group Interviews

Krueger and Casey (2000) and Morgan (1997) recommended that the ideal focus group would have six to eight participants, but not more than ten. For the purpose of designing the research instrument, three focus group interviews with the goal of having a minimum of six participants in each group were intended to be conducted with food handlers from independent Chinese and Mexican restaurants. Due to employees' time constraints and difficulty to recruit, conducting three focus groups was not feasible. Therefore, one focus group interview was conducted with seven food handlers in non-supervisory positions from an independent Mexican restaurant. In addition, four group interviews ranging from two to three participants were conducted with a total of ten food handlers from independent Mexican and Chinese restaurants.

The group interviews were conducted in place of typical focus group interviews to accommodate participants who worked in the same place and/or had similar work schedules. This allowed to get a full range of ideas, look for patterns and themes across groups and reach data saturation as suggested by Krueger and Casey (2000). The interview questions explored the social cognitive elements that may influence the participants' food safety behaviors.

A convenience sample of independent Mexican and Chinese restaurants owners/managers (n = 30) were contacted to request their permission to recruit participants from their operations. A screening script and protocol was used to contact the restaurants owners/managers (Appendix A). After obtaining the owners' or managers' approval, a flyer (Appendix B) containing information about the study and a sign-up sheet were delivered to the

restaurants in person. To ensure consistency, participants were randomly chosen based on two selection criteria. First, participants should be at least 18 years of age at the time of recruitment. Second, participants should be food handlers in non-supervisory jobs.

All interviews followed a questioning route with open-ended questions and other probe questions if required (Appendix C). The questioning route was prepared by the researcher based on previous research (Abbot et al., 2009; Bearth et al., 2014; Clayton et al. 2002; Howells et al., 2008; Meysenburg, Albrecht, Litchfield, & Ritter-Gooder, 2014; Pilling, Brannon, Shanklin, Howells, & Roberts, 2008; York et al., 2009) and was reviewed by the supervisory committee members. All interviews were held in a location deemed convenient for participants and away from their work site with only two group interviewees chose to be interviewed at their operation due to their time limit. Each interview lasted on average about one hour with the shortest lasting only 45 minutes and the longest lasting almost 2 hours. Each participant was provided a consent form to sign (Appendix D) and received $20 as a token of appreciation for their participation. A demographic and operational information questionnaire was completed by participants at the end of each session (Appendix E).

The interviews were conducted in the spoken language of participants. Participants were offered a choice of being interviewed in English, Spanish, or Chinese. The focus group and group interviews were audio-recorded, transcribed, and coded by the main researcher using a thematic codes list including both pre-established and free codes. Non-English interviews were translated into English by a bilingual researcher with experience in qualitative studies before any analyses were performed. To ensure reliability and inter-coder agreement (Creswell, 2009), an experienced researcher was asked to independently transcribe and code the recordings. Coding themes were then examined, and any disagreement was resolved. The coded data was analyzed

using the procedures of NVivo 12 Plus for Windows (Version 12; QSR International Pty Ltd., 2017) to identify themes and patterns. Multiple procedures were implemented to ensure validity in terms of the accuracy and credibility of the results. Using different data sources from participants in different restaurants enabled triangulation to improve the dependability of the data. In addition, a peer debriefing procedure having an experienced researcher review the focus group and group interviews and ask questions about the procedures as recommended by Creswell (2009) added to the validity of the results.

Survey Instrument Design

Questionnaire

Utilizing results of the focus group, group interviews, and a thorough literature review, a questionnaire was developed (Appendix F). The questionnaire was comprised of six subscales to measure the four constructs of the SCT (self-efficacy, self-regulation, outcome expectation, and environmental determinants), food safety behavioral intentions, and self-reported food safety behaviors.

Questionnaire Items

Eleven demographic and operational information items (gender, ethnicity, age, level of education, number of years of experience, current position, type of restaurant ownership, restaurant theme, type of service, food safety training received, and food safety certification) were included to describe and understand the sample. The self-efficacy scale included 10 items using a 5-point Likert-type scale (1 = cannot do at all to 5 = can do for sure) adopted with modifications from previous research (Brandon, 2010; Byrd-Bredbenner, Wheatley, & Schaffner, 2007). The environmental determinants scale included ten items measured on a 5-

point Likert scale (1 = strongly disagree to 5 = strongly agree) adopted from (Abidin, Arendt, and Strohbehn (2014) and De Boeck, Jacxsens, Bollaerts, and Vlerick (2015).

The outcome expectations scale included eight items measured on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree) adopted with modification from Tudoran, Scholderer, and Brunsø (2012). The outcome expectations items include social, physical, and self-evaluative consequences of the behavior as identified by Bandura (2004).

The self-regulation scale consisted of three subscales, self-monitoring, goal setting and self-evaluation as indicated by Bandura (1991). The three subscales were measured with three items each on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree) adopted with modification from Scholz, Nagy, Göhner, Luszczynska, and Kliegel (2009).

Food safety behavioral intentions were measured with six items on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree) adopted from Lee, Almanza, Jang, Nelson, and Ghiselli (2013) and Hinsz and Nickell (2015). Twelve items were used to measure self-reported food safety behavior using a frequency response scale (1 = never to 5 = always) adopted from Pilling, Brannon, Shanklin, Roberts, Barrett, and Howells (2008) and York et al. (2009). The food safety behaviors scale focused on three food safety behaviors that were found implicated to the recurring incidence to foodborne illnesses in restaurants: hand washing, use of thermometer, and proper handling of food and work surfaces (FDA, 2009; Howells et al., 2008; Pilling, Brannon, Shanklin, Howells, & Roberts, 2008; York et al. 2009).

A variety of scale types and response formats were used throughout the questionnaire to mitigate the potential impact of common method bias associated with the cross-sectional self-reporting method used, and to alleviate potential social desirability bias caused by commonalities in scale endpoints (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). In addition, anonymity of

respondents and their answers were assured to reduce the effect of evaluation apprehension. Harman's single-factor test was used to diagnose if common method variances exist (Podsakoff & Organ, 1986). The questionnaire was translated to Chinese and Spanish, and back translated to English to ensure the correct wording was used. To assess content validity, an experienced researcher in food safety behavior reviewed the questionnaire for face validity and adequacy of the scales' content.

Pilot Study

The questionnaire was pilot tested with a sample of 25 food handlers from independent Chinese and Mexican restaurants according to the recommendations of Finn, White, and Walton (2000) to check the wording and clarity of the questions. Some evaluative questions (Appendix G), such as respondents' perceptions of the length or difficulty of the questionnaire were added. Based on the results of the pilot test, minor changes in the questionnaire design and wording were made. For instance, unnecessary spaces between questions were adjusted to reduce the number of pages and thus reducing fatigue of participants due to completing long questionnaires. Also, item D in the question about participants' level of education in the Spanish version was changed from "Algo de universidad" to "Algunas clases universitarias", which means completing some college-level classes and is more consistent with the English version.

Survey Instrument Administration

Use of Human Subjects in Research

The research protocol was reviewed and approved by the Institutional Review Board (IRB) at Kansas State University prior to collecting any data. The IRB approval is in Appendix H.

Data Collection

Restaurants owners/managers were contacted in person to request the participation of their employees. Upon receiving owners/managers approval, the questionnaire was administered on-site with the goal of sampling five food handlers from each of the 30 restaurants. If the selected restaurant owner/manager declined the participation of their food handlers or less than five participants completed the questionnaire, a replacement was taken from other independent Chinese or Mexican restaurants in the surrounding areas until the target number of participants was obtained. Consistent with IRB guidelines, each employee received a cover letter which included information about the study. Participants who completed the questionnaire after having read the letter of information were presumed to have given informed consent. Each participant who completed the questionnaire received $5 as a token of appreciation for their participation in the survey.

Data Analysis

Data was analyzed using SPSS for Windows (Version 25; IBM, Inc., Chicago: IL, 2017). Cronbach's alpha coefficient was computed to determine the internal consistency/reliability for each scale. A cut-off point of 0.70 was used to demonstrate consistency (Nunnally & Bernstein, 1994). In addition, confirmatory factor analysis (CFA) was conducted using AMOS for Windows (Version 25; IBM, Inc., Chicago: IL, 2017) to test the constructs' validity in the

proposed model. Descriptive statistics (frequencies, means, and standard deviations) were computed to summarize and screen the data. Multiple regression analysis was used to examine the ways in which the constructs act alone and together to influence behavioral intentions and self-reported food safety behaviors. Mediation analysis was performed using the procedures of the PROCESS macro developed for SPSS (Hayes, 2017) including the Sobel test and bootstrap confidence intervals to examine the indirect effect of food safety behavioral intentions and its confidence interval. All significance levels were set at $P < 0.05$.

Chapter 4 - Results

Focus Group and Group Interviews

The questions used in the focus group and group interviews are presented in Appendix C. A total of 17 food handlers representing eight restaurants agreed to participate in the focus group and group interviews. One focus group was conducted with seven food handlers in non-supervisory positions from an independent Mexican restaurant. Four group interviews, ranging from two to three participants were conducted with a total of ten food handlers from seven independent Mexican and Chinese restaurants.

Demographic and Operational Characteristics

Demographics of participants and their operational characteristics are presented in Table 4.1. The majority (n = 11) of participants were female and 11 participants were Hispanic, while six participants were Chinese. The participants were well-diversified regrading educational level. Only three participants indicated they had previous food safety training and one participant indicated they had a food safety certification. All operations were independent Mexican (n = 3) and Chinese restaurants (n = 5).

Table 4.1 Focus Group and Group Interviews: Demographic and Operational Characteristics

Characteristic	Frequency
Age Group	
18-25 years	3
26-33 years	3
34-41 years	5
42-49 years	3
50 years and older	3
Gender	
Female	11
Male	6
Ethnicity	
Hispanic or Latino	11
Asian	6
Education	
less than high school	2
High school/GED	6
Associate degree	2
Some college	2
Bachelor's degree	3
Graduate degree	2
Position	
Prep cook	8
Line cook	6
Other	2
Executive chef	1
Years of Experience	
5 years or less	13
6-15 years	3
26 years or more	1
Type of Service	
Casual dining	11
Quick service (Fast food)	5
Quick casual	1
Food Safety Training	
No	14
Yes	3
Food Safety Certification	
No	16
Yes	1

Identified Themes and Sub-Themes

Analysis of the focus group and group interviews responses showed nine main themes across all responses. Table 4.2 summarizes the themes and sub-themes identified based on the frequency of statements mentioned by the participants.

Table 4.2 Identified Themes and Sub-Themes

Theme	Frequency
Self-Efficacy	14
Self-Regulation	
Habit	26
Goals setting	17
Self-monitoring	7
Self-regulation learning strategies	7
Environmental Factors	
Physical environmental factors (equipment and resources)	18
Time constraints	17
Social environmental factors	12
Training and access to food safety information	4
Inspection by officials	3
Outcome Expectations	
Reducing risk of foodborne illnesses, avoiding lawsuits, and maintaining good reputation	46
Time constraints and cost of supplies	5
Behavioral Intentions	4
Food safety Behaviors	
Hand washing	22
Cleaning, sanitizing, and avoiding cross-contamination	22
Use of a thermometer	11
Cultural Background	33
Attitude	6
Knowledge	4

Theme 1 represented self-efficacy. Participants in both the focus group and group interviews talked about their confidence to perform hand washing, handling practices of food and

contact surfaces, and use of a thermometer. The statements mentioned were in response to a question asking about the extent of their confidence and ability to perform these three behaviors. The participants expressed their confidence by statements like *"I am confident I do it every time before I serve"* and *"Constantly, I already have fifteen years of work in a restaurant and I have to wash my hands."* One participant also addressed the importance of the ability and willingness to perform food safety practices saying, *"but for me the main thing is the ability and the intelligence and the will."* Another participant emphasized their confidence to perform handwashing as a basic rule saying, *"I am very confident. It is a very basic rule that everyone follows here even when it is a busy time."*

Theme 2 encompassed self-regulation with four sub-themes including habit, goals setting, self-monitoring, and self-regulated learning strategies. Participants emphasized the role of habit in shaping their behavior. In response to the intention to perform handwashing, one participant mentioned that *"I can tell you that I always do it because it is a habit."* Another participant expressed the role of habit in guiding their hand washing behavior saying, *"I think most of the time I just follow what I did yesterday and the day before that."* Another participant also addressed the power of habit saying, *"the habit makes you something mechanical [perform it automatically], something that you do not even think about or plan because you already know what you are going to do every day."*

Having a goal in mind when performing food safety behaviors was apparent from the discussion of participants. One participant referring to another participant from the same restaurant stated that *"he does not do it because he has to do it, but because we have in mind that I have to, I have to wash my hands, it's not in our mind, in a hemisphere of our brain."* Another participant stated that finishing a task within a certain time was another goal. *"sometimes we set*

the goal by making sure it [the food] is handled within certain time," he stated. Another participant from another group also said that "*the goal is my preparation list that I have to finish*." Other goals related to finishing a task or serving foods that appeal to customers were reported. One participant mentioned, *"I try to make sure that all the food is hot and arrived warm to the client, that's the goal."* Similarly, another participant stated, *"the goal is for everything to be tasty, for it to come out good."*

Some participants indicated that they self-monitor their food safety practices. One participant said, *"I remind myself that we did not have to leave meat more than 15 minutes outside."* Another participant also stated that *"it is practiced every day because for example she [coworker] checks on me and I check what she is doing because I understand we are seeing each other."*

The way by which participants learned self-regulation was another sub-theme that emerged. One participant mentioned that *"then I grabbed a book and it was where I learned because there are all those rules [in that book]."* Another participant highlighted the role of experience in developing self-regulation strategies saying, *"the interest to do it and the experience that we have been acquiring through the years. Every day we learn something new that we have very present."*

Theme 3 represented environmental factors that may influence food safety behavior. One participant highlighted the role of work conditions in their restaurant as a constraint to properly follow handwashing behavior saying, *"in practice it is 5% that follows it because there is neither time nor the conditions are the most adequate to wash hands."* Similarly, another participant expressed their concern about irritating disinfectants used saying *"the condition must be expressed to the employer so that the employer puts in whatever is necessary so that a person*

can work….the employer can put another disinfectant that is not harmful to their skin." Two participants mentioned that the availability of necessary supplies and tools is important to facilitate their food safety behavior. They said, *"soap, disinfectant, thermometers, gloves. Everything we need to do things."* And *"we have the sink to wash our hands, we have everything we need. And you have it at hand in front of you, so you do not forget."* The role of social support by managers or supervisors in influencing food safety behavior is apparent. One participant said, *"I think the manager, or the supervisor has to set a good model in every good manufacturing practice. They have to do this on themselves and then they will monitor others and give them rewards or punishment if needed."*

The role of time constraints in hindering following food safety behaviors properly stood out from the discussion of one group participants. One participant said, *"sometimes circumstances do not give you [allow] to follow the procedures of how food should be handled and how areas should be disinfected. Because it is so much the volume of people or gets so busy that it does not give you time for anything."* Another participant also mentioned, *"then the procedure is lost because there is not enough time or the necessary personnel to do the work."*

Training and access to food safety information as an external influencer of the behavior was evident. One participant said, *"I don't think there is training here, that we as Hispanic are a lot of do this and do the other thing [lots of instructions that do not pertain to them], but in American restaurants we do not have it either, that information is not there at hand."* Another participant also said, *"every worker before being a food server has to go through a series of training to make sure good practices are practiced."* Inspection by health authorities was another external influencer mentioned by some participants. One participant said*, "the first most basic of a restaurant and for me is what the inspector says hot hot and cold cold [maintain the*

temperature of food]" The participant continued and said in reference to cleaning and sanitizing work surfaces, *"and we have to clean it as I say is not that one has invented it, is that the State inspection requires it."*

Theme 4 represented outcome expectations regarding the advantages and/or disadvantages of following food safety behaviors. Participants across all groups emphasized on the advantages of following proper food safety behaviors. One participant said, *"avoid lawsuits, diseases. Quality. So that the client is satisfied."* Another participant also mentioned, *"so if you realize how important it is to follow the rules because you never know when you can infect someone."* avoiding loss of job and closure was mentioned by a participant saying, *"if someone got sick because of eating our food, we are going to lose our job, they are going to shut down, the inspection comes, and everybody will lose job."* Another participant also said, *"have more people coming to eat with us because they see you [serving] very hygienic food and restaurant [clean restaurant]. The opinion of the clients."* On the other hand, the potential disadvantages based on the discussion of participants can be disregarded. One participant said, *"it looks as disadvantage but compared to advantages it is nothing. You spend on food safety like handwash soap, and hats. You have to expend cost on those kinds of things."* Another participant also mentioned, *"there is no disadvantage, for me it is all an advantage to do things correctly."*

Theme 5 encompassed food safety behavioral intentions. Participants discussed their intention to carry out food safety behaviors and how it guides their behaviors. One participant exhibited the importance of employees' behavioral intention saying, *"in many places you have the rules that you have to follow, it depends on them whether they want to do it or not, because they are told, you are going to do this and this, but it is already dependent on the person."* Another participant mentioned how their behavioral intention may decrease by the time saying,

"I think my desire or my intention to follow this rule kind of decrease as the time increase working in this industry."

Theme 6 represented three food safety behaviors, including hand washing, handling of food and work surfaces, and use of a thermometer. When asked about the frequency of practicing handwashing, participants reported several practices. One participant said, *"I sing a song like happy birthday when I wash my hands."* Another participant mentioned, "*every time you start the work you have to wash your hands."* Another participant also stated, *"once you are leaving the work area when you come back you have to wash your hands. I only wash my hands when I leave and come back to the work area."* And when asked about how they wash their hands, one participant said, *"the definition [of handwashing] would be something quick. Without brush."*

Participants mentioned several practices related to handling of food and contact surfaces. For example, one participant talked about preventing cross-contamination saying, *"in the case of preparation, a different color is used, a different cutting board for vegetables and meats."* Similarly, another participant stated, *"I have to strictly separate the raw material from the cooked material."*

Cleaning of food contact surfaces was another practice mentioned by participants. For instance, one participant said, *"when we start, it's the first thing we do. Clean everything well with chlorine to disinfect well."* Although not many participants reported the use of a thermometer very often, they mentioned other practices to ensure food reached the desired temperature. For example, one participant said, *"we do not really measure the temperature of the food, but we make sure it is in a safe environment [condition]. For the hot food we make sure it is boiled or over a hundred."* When asked about when they use a thermometer, one participant stated, *"when I don't trust cooking to the right temperature."* Some participants mentioned the

proper use of a thermometer. One participant said, *"well, you put it in the food to the bottom [the thickest part of the food] and there it will mark the degrees to which the food is at and whether it is hot, or it is cold."* Another participant mentioned, *"what I do, sometimes, is to put the thermometer inside the food to take the temperature."*

Theme 7 represented the cultural background of food handlers and its influence on their food safety practices. This theme dominated the discussion of a Chinese and a Mexican group. Participants described how their cultural background influence their food safety behavior. One participant said, *"as we come with a different culture and that influences the practices that I have."* Another participant stated, *"whenever they come to do the inspection, they ask questions that I seriously do not know how to answer because this the cooking method we use. Unless I did it this way, I have to take it from the menu."* Another participant also mentioned, *"one arrives in this country and begins to learn, but the culture that one brings is to the root because not all we do in the restaurant is what they teach us [public health authorities]."*

Theme 8 represented employees' attitude to food safety. When asked about what practices they perform to ensure food safety, one of the participants elaborated, *"first the attitude. After having the tools that we have, if we do not have the attitude we will not do it."* Another participant stated, *"many people do not have the responsibility to do things correctly and the attitude also falls."* Other participants also explained how they approach food safety, *"I have to prepare for that person, I have to prepare it as if it were for me.…we sincerely like it, that's why we are both working together, we like it, and we do it well."*

Theme 9 represented food safety knowledge. Some participants expressed their knowledge of food safety rules. When asked about factors that make it easier to perform hand washing, one participant stated, *"but what makes it easier for you to do it is that you already*

know that if you do not do it the bacteria can come if you already know that bacteria can get there, you are like this you have to wash your hands." Another participant mentioned, *"it is important because we know that if the hot food is not more than 135 degrees [fahrenheit] it begins to spoil."* Another participant emphasized the importance of improving food safety knowledge said, *"improvement for oneself for knowledge. If we ever get to another place [another operation], and they tell you to see how you do this, can you read the thermometer? It is to improve knowledge."*

The results of the focus group and group interviews helped to generate an item pool for the measurement scales in the survey instrument. The most frequently discussed thematic items identified from the transcripts along with other items adopted from previous literature were developed into 55 statements in Likert-format on a scale of 1 to 5. For example, self-efficacy included ten items to measure the participants' level of confidence about their ability to perform the three investigated behaviors. Self-efficacy items were phrased using similar language reported by the interviewees like the scale item *"constantly prepare food in a sanitary manner, even when I am busy with other tasks."* Similarly, the sub-themes of the environmental factors were used to build up the items in the environmental determinants scale. For instance, the sub-theme time constraints were developed into the scale item *"I get sufficient time to work in a hygienic and safe food way."* The sub-themes of outcome expectations regarding the advantages and disadvantages of performing proper food safety behaviors were also used in the outcome expectations scale. For example, reducing risk of foodborne illnesses, avoiding lawsuits, and maintaining good reputation were sub-themes that were incorporated in scale items like *"I will help protect my restaurant from liability for foodborne illnesses"* and *"I will help protect the reputation of my restaurant."*

Survey Results

A total of 250 questionnaires were distributed on-site and 204 participants from 66 independent Chinese and Mexican restaurants participated with a range of one to five participants from each restaurant. Due to incomplete data or responses from non-food handlers, only 201 responses were usable. The overall response rate was 80.4%.

Respondents' Demographics

Respondents' characteristics and operational data are presented in Table 4.3. Respondents ranged in age from 16 to 74 years, with a mean age of 35.7 ± 12.6 years old. Slightly more than half of the respondents (56.2%) were male and 42.3% were female. The majority of food handlers participated in the study were line cooks (34.8%) and prep cooks (28.9%), while 26.9% held other positions such as servers, food expeditors, cashiers or owners/operators whose duties include food handling. Most of the respondents have been employed in the foodservice industry for five years or less (42.8%) and six to fifteen years (35.8%). The majority of the investigated restaurants were independent Mexican restaurants (66.7%) and 33.3% were independent Chinese restaurants. More than half of the respondents (64.7%) indicated they received food safety training and 35.3% indicated they had food safety certification such as the state of Kansas food handler training certificate.

Table 4.3 Demographics of Respondents and their Operational Information *(N=201)*

Characteristic	Frequency[a]	Percentage	Characteristic	Frequency[a]	Percentage
Gender			**Restaurant Ownership**		
Male	113	56.2	Independent	66	100
Female	85	42.3	**Restaurant Theme**		
Ethnicity			Mexican	44	66.7
Hispanic or Latino	103	51.2	Chinese	22	33.3
Asian	75	37.3	**Type of Service**		
Caucasian	13	6.5	Casual dining	26	39.4
Native American	5	2.5	Quick casual	20	30.3
African American	2	1	Buffet	10	15.2
Other	3	1.5	Quick service (Fast food)	9	13.6
Education			Fine dining	1	1.5
less than high school	34	16.9	**Food Safety Training**		
High school/GED	75	37.3	Yes	130	64.7
Associate degree	25	12.4	No	71	35.3
Some college	34	16.9	**Food Safety Certification**		
Bachelor's degree	28	13.9	No	116	57.7
Graduate degree	4	2	Yes	80	39.8
Position					
Line cook	70	34.8			
Prep cook	58	28.9			
Other	54	26.9			
Executive chef	17	8.5			
Years of Experience					
5 years or less	86	42.8			
6-15 years	72	35.8			
16-25 years	24	11.9			
26 years or more	19	9.5			

Note. [a] Responses may not equal 201 due to non-response to an item.

Descriptive Statistics

Table 4.4 presents the means and standard deviations for each of the measures. Responses indicated that food handlers were confident in their ability to perform proper food safety practices with a composite mean score of 4.59 ± 0.41. The highest mean score (4.72 ± 0.40) was for the item *"clean and sanitize food contact surfaces before and after preparing food"* and the lowest mean score (4.46 ± 0.66) was for the item *"use the thermometer at the completion of reheating food to 165°F."*

Table 4.4 Means, Standard Deviations, and Reliability of Measurement Scales

Scale Items	Mean	Std. Deviation
Self-Efficacy *(α = 0.85)*		
Clean and sanitize food contact surfaces before and after preparing food.	4.72	0.40
Constantly prepare food in a sanitary manner, even when I am busy with other tasks.	4.67	0.47
Wash my hands when food preparation tasks are interrupted or changed.	4.65	0.47
Correctly use a thermometer to determine if food is cooked to a safe temperature.	4.50	0.64
Use the thermometer to ensure proper food holding temperature.	4.51	0.58
Use the thermometer at the completion of reheating food to 165°F.	4.46	0.66
Composite Score	**4.59**	**0.41**
Self-Regulation *(α = 0.87)*		
I have a goal to ensure food has reached a safe temperature for service and consumption.	4.67	0.42
I monitor my own handling practices of food and work surfaces.	4.67	0.38
I evaluate my handwashing practices to ensure I follow the proper steps.	4.65	0.41
I closely monitor my handwashing practices during my shift.	4.58	0.47
I always set a goal to ensure food safety when handling food and work surfaces.	4.55	0.48
I always evaluate my own handling practices of food and work surfaces.	4.54	0.46
I monitor my thermometer use practices to ensure food safety.	4.45	0.58
I evaluate myself when I use a food thermometer.	4.40	0.60
Composite Score	**4.56**	**0.35**
Environmental Determinants *(α = 0.90)*		
The necessary infrastructure and equipment (e.g., hand washing sinks) are available and accessible to support food safety.	4.73	0.34
My manager/supervisor enforces food safety rules consistently with employees.	4.67	0.41

My manager/supervisor is actively involved to ensure safe food handling is practiced.	4.66	0.39
My manager/supervisor inspires me to follow proper food safety practices.	4.61	0.48
Facilities are adequately equipped to follow safe food handling practices.	4.61	0.44
Procedures and instructions concerning food safety are provided to me.	4.60	0.46
My coworkers are always supportive of each other regarding food safety.	4.58	0.48
Sufficient education and food safety training are provided.	4.53	0.49
I get sufficient time to work in a hygienic and safe food way.	4.51	0.52
Sufficient financial resources are provided to support hygiene and food safety.	4.50	0.54
Composite Score	**4.65**	**0.45**
Behavioral Intentions *(α = 0.86)*		
I am willing to separate raw food from ready-to-eat food during preparation.	4.79	0.30
I am willing to clean and sanitize food contact surfaces between each use.	4.73	0.36
I plan to wash my hands whenever it is required.	4.66	0.46
I intend to use a food thermometer to check the temperature on the hot line/cold line.	4.55	0.51
I plan to use a food thermometer at the completion of reheating food.	4.51	0.53
I intend to use a food thermometer at the completion of cooking.	4.45	0.58
Composite Score	**4.62**	**0.36**
Outcome Expectations *(α = 0.72)*		
I will help protect my restaurant from liability for foodborne illnesses.	4.75	0.35
Customers will be satisfied.	4.65	0.43
I will feel a sense of accomplishment.	4.59	0.48
My manager/supervisor will praise my performance.	4.38	0.62
Composite Score	**4.59**	**0.35**
Self-Reported Food Safety Behaviors *(α = 0.88)*		
I wash my hands after sneezing, coughing, or using a tissue.	4.85	0.23
I wash my hands when starting shift.	4.78	0.31
I wash, rinse, and sanitize food contact surfaces between working with different types of food or ingredients.	4.75	0.32
I wash my hands before putting on or changing gloves.	4.61	0.46
I use a thermometer to ensure that hot food is held at 135°F or higher and cold food is held at 41°F or less.	4.60	0.50
I check the internal temperature of food by inserting the thermometer's probe into the thickest part of the product.	4.50	0.59
I use a thermometer to check the temperature of food at the completion of cooking.	4.46	0.61
I use a thermometer to check the temperature of food at the completion of reheating.	4.42	0.66
Composite Score	**4.62**	**0.36**

For the items developed to measure the construct of self-regulation, the composite mean score was high (4.56 ± 0.35) with the highest mean score (4.67 ± 0.42) for the item *"I have a*

goal to ensure food has reached a safe temperature for service and consumption" and the item "I monitor my own handling practices of food and work surfaces" (4.67 ± 0.38) and the lowest mean score (4.40 ± 0.60) for the *item "I evaluate myself when I use a food thermometer."*

Environmental determinants had a high composite mean score (4.65 ± 0.45). Overall, the item *"necessary infrastructure and equipment (e.g., hand washing sinks) are available and accessible to support food safety"* had the highest mean score (4.73 ± 0.34) and the item *"sufficient financial resources are provided to support hygiene and food safety"* yielded the lowest mean score (4.50 ± 0.54).

The construct of outcome expectations had a composite mean score of 4.59 ± 0.35 with the highest mean score (4.75 ± 0.35) for the item *"I will help protect my restaurant from liability for foodborne illnesses."* and the lowest mean score (4.38 ± 0.62) for the item *"my manager/supervisor will praise my performance."*

Food safety behavioral intentions responses indicated that respondents generally rated their intentions as high (4.62 ± 0.36) with the highest mean score (4.79 ± 0.30) for the item *"I am willing to separate raw food from ready-to-eat food during preparation"* and the lowest mean score (4.45 ± 0.58) for the item *"I intend to use a food thermometer at the completion of cooking"*.

The composite mean score for self-reported food safety behavior was 4.62 ± 0.36. The highest scored items were *"I wash my hands after sneezing, coughing, or using a tissue"* (4.85 ± 0.23) and *"I wash my hands before and after handling raw food"* (4.84 ± 0.25). The lowest scored item was *"I use a thermometer to check the temperature of food at the completion of reheating"* (4.42 ± 0.66).

Scale Reliability

An internal consistency and reliability analysis was conducted by computing Cronbach's alpha coefficients for all scales. Scales reliabilities are presented in Table 4.4. The scales demonstrated high levels of reliability which exceeded the cutoff point of 0.7 (Nunnally & Bernstein, 1994), with self-efficacy Cronbach's $\alpha = 0.85$, self-regulation Cronbach's $\alpha = 0.87$, environmental determinates Cronbach's $\alpha = 0.90$, outcome expectations Cronbach's $\alpha = 0.72$, behavioral intentions Cronbach's $\alpha = 0.86$, and self-reported food safety behaviors Cronbach's $\alpha = 0.88$. All items in the scales appeared to be worthy of retention, resulting in a decrease in the alpha if deleted. The only exception was the problematic items with small loadings on their construct. As such, these items were removed before proceeding to further analysis.

Constructs Validity

Harman's single-factor test was performed prior to performing the main analyses to ensure that the study results were not significantly influenced by common method variance. Results showed that one factor did not explain most of the variance (40.8%), indicating that common method variance was not an issue (Podsakoff & Organ, 1986). Confirmatory factor analysis (CFA) was performed to examine convergent and discriminant validity of the scales. The initial results of CFA showed a weak fit of the model to the data $\chi^2/df = 2.53$, GFI = 0.58, CFI = 0.69, NFI = 0.58, IFI = 0.69, and RMSEA = 0.08. However, the standardized factor loadings, the modification indices, and the standardized residuals suggested that a better fit could be obtained by excluding problematic items with standardized factor loadings less than 0.50 and had more error variance than explained variance (Hair, Black, Babin, Anderson, & Tatham, 2006). The items with low standardized factor loadings included four items from the self-

efficacy scale, one item from the self-regulation scale, four items from the outcome expectations scale, and four items from the self-reported food safety behaviors scale as shown in Table 4.5. The goodness-of-fit indices for the hypothesized model after removing the problematic items are presented in Table 4.6.

Table 4.5 Problematic Items Removed from the Measurement Scales

Scale Items Removed
Self-Efficacy
Item # 3 Wash my hands with soap and water for 20 seconds before I begin to prepare food.
Item # 5 Perform proper food handling practices to prevent cross-contamination.
Item # 6 Wash my hands before putting on or changing gloves.
Item # 8 Wash my hands after using the restroom, coughing, sneezing, smoking, or touching body parts.
Self-Regulation
Item # 15 I wash my hands with a goal to ensure food safety.
Outcome Expectations
Item # 38 I will not be able to focus on primary tasks of preparation and cooking.
Item # 40 I will reduce the risk of foodborne illnesses.
Item # 42 I will help protect the reputation of my restaurant.
Item # 43 I will avoid losing my job.
Self-Reported Food Safety Behaviors
Item # 47 I wash my hands before and after handling raw food.
Item # 48 I wash my hands after touching anything that may contaminate hands (chemicals, non-sanitized work surfaces, body parts).
Item # 50 I cover and label food properly before storing or holding.
Item # 51 I separate raw products from ready-to-eat products when preparing food.

Table 4.6 Goodness-of-fit Indices for the Hypothesized Model

CFA Results	χ^2/df	CFI[a]	GFI[b]	IFI[c]	RMSEA[d]	NFI[e]
Measurement	2.24	0.83	0.73	0.83	0.07	0.73

Note. N = 201.
[a] CFI = comparative fit index.
[b] GFI = goodness of fit index.
[c] IFI = incremental fit index.
[d] RMSEA = root mean square error of approximation.
[e] NFI = normed fit index.

Although the model fit indices did not meet the cutoff values proposed by Hu and Bentler (1999), Hair et al. (2006) suggested that these cutoff points are guides for usage, not absolute criteria and they should be considered in line with the model itself, the sample, and the research context to establish what is an acceptable model.

To verify the fit of the hypothesized model, bootstrap confidence intervals of 5,000 samples were computed and the results indicated that the model fit in 4,548 out of the 5,000 bootstrap samples with $p < 0.05$ for all standardized regression weights of the model constructs. In addition, the Bollen-Stine bootstrapping procedure (Bollen & Stine, 1992) was used to test the null hypothesis that the model is correct. The result showed that the null hypothesis was not rejected ($p = 0.09$), indicating that the model is fit.

Convergent Validity

Hair et al. (2006) indicated that convergent validity is the extent to which the items of each construct share a proportion of variance in common and can be estimated by examining the factor loadings, the average variance extracted, and the reliability of the scale. Table 4.7 presents the standardized factor loadings for each item within the scales and the average variance extracted. The results showed that all standardized factor loadings are higher than 0.50. The average variance extracted estimates of behavioral intentions and self-reported food safety behaviors met the 50% cutoff point (Hair et al., 2006), while self-efficacy, outcome expectations, self-regulation, and environmental determinants had lower average variance. However, given that all constructs reliability coefficients exceeded 0.7 as shown in Table 4.4, these results provided an adequate evidence of convergent validity of the measurement scales.

Table 4.7 Completely Standardized Factor Loadings and Average Variance Extracted

Scale Items	SE	SR	ED	BI	OE	SFB
Use the thermometer to ensure proper food holding temperature.	0.82					
Correctly use a thermometer to determine if food is cooked to a safe temperature.	0.79					
Use the thermometer at the completion of reheating food to 165°F.	0.76					
Wash my hands when food preparation tasks are interrupted or changed.	0.62					
Clean and sanitize food contact surfaces before and after preparing food.	0.59					
Constantly prepare food in a sanitary manner, even when I am busy with other tasks.	0.53					
I monitor my thermometer use practices to ensure food safety.		0.74				
I monitor my own handling practices of food and work surfaces.		0.74				
I evaluate my handwashing practices to ensure I follow the proper steps.		0.74				
I always evaluate my own handling practices of food and work surfaces.		0.73				
I evaluate myself when I use a food thermometer.		0.69				
I have a goal to ensure food has reached a safe temperature for service and consumption.		0.65				
I always set a goal to ensure food safety when handling food and work surfaces.		0.65				
I closely monitor my handwashing practices during my shift.		0.58				
Procedures and instructions concerning food safety are provided to me.			0.77			
My manager/supervisor inspires me to follow proper food safety practices.			0.74			
I get sufficient time to work in a hygienic and safe food way.			0.74			
Sufficient financial resources are provided to support hygiene and food safety.			0.70			
Sufficient education and food safety training are provided.			0.70			
My manager/supervisor is actively involved to ensure safe food handling is practiced.			0.70			
Facilities are adequately equipped to follow safe food handling practices.			0.70			
The necessary infrastructure and equipment (e.g., hand washing sinks) are available and accessible to support food safety.			0.68			
My manager/supervisor enforces food safety rules consistently with employees.			0.67			
My coworkers are always supportive of each other regarding food safety.			0.62			
I plan to use a food thermometer at the completion of reheating food.				0.83		
I intend to use a food thermometer at the completion of cooking.				0.77		
I intend to use a food thermometer to check the temperature on the hot line/cold line.				0.75		
I am willing to clean and sanitize food contact surfaces between each use.				0.71		
I plan to wash my hands whenever it is required.				0.63		
I am willing to separate raw food from ready-to-eat food during preparation.				0.54		
My manager/supervisor will praise my performance.					0.81	
Customers will be satisfied.					0.68	

I will feel a sense of accomplishment.					0.63	
I will help protect my restaurant from liability for foodborne illnesses.					0.55	
I use a thermometer to check the temperature of food at the completion of reheating.						0.88
I use a thermometer to check the temperature of food at the completion of cooking.						0.80
I check the internal temperature of food by inserting the thermometer's probe into the thickest part of the product.						0.76
I use a thermometer to ensure that hot food is held at 135°F or higher and cold food is held at 41°F or less.						0.75
I wash my hands before putting on or changing gloves.						0.65
I wash my hands when starting shift.						0.62
I wash, rinse, and sanitize food contact surfaces between working with different types of food or ingredients.						0.59
I wash my hands after sneezing, coughing, or using a tissue.						0.54
Average Variance Extracted	48%	48%	49%	50%	45%	50%

Note. SE= Self-efficacy, SR= Self-regulation, ED= Environmental Determinants, BI= Behavioral Intentions, OE= Outcome Expectations, SFB= Self-Reported Food Safety Behaviors

Discriminant Validity

Discriminant validity is the extent to which the measured items represent only one latent construct that is distinct from other constructs (Hair et al., 2006). Table 4.8 shows the constructs correlation matrix, with the bolded values indicating the squared correlation. To assess discriminant validity, the average variance extracted percentages were compared with the squared correlation values between the constructs. The average variances extracted from Table 4.7 were relatively greater than most of the corresponding squared correlation estimates between the constructs in Table 4.8. Thus, this test suggested that discriminant validity was established.

Table 4.8 Constructs Correlation Matrix

	SE	SR	ED	BI	OE	SFB
SE	1.00	**0.46**	**0.27**	**0.32**	**0.30**	**0.45**
SR	0.68	1.00	**0.52**	**0.55**	**0.40**	**0.56**
ED	0.52	0.72	1.00	**0.42**	**0.42**	**0.40**
BI	0.57	0.74	0.65	1.00	**0.36**	**0.49**
OE	0.55	0.63	0.65	0.60	1.00	**0.31**
SFB	0.67	0.75	0.63	0.70	0.56	1.00

Note. **Values below the diagonal are correlation estimates and values above the diagonal are squared correlations.**
SE= Self-efficacy, SR= Self-regulation, ED= Environmental Determinants, BI= behavioral intention, OE= Outcome Expectations, SFB= Self-Reported Food Safety Behavior

Results of Multiple Regression Analysis

Multiple regression analysis was performed to test the hypotheses and the relationships between food safety behavioral intentions (dependent variable) and self-efficacy (Hypothesis 1), environmental determinants (Hypothesis 2), outcome expectations (Hypothesis 3), and self-regulation (Hypothesis 4) as independent variables. The underlying assumptions of the linear model were assessed to ensure the regression model can generalize outside of the sample. The Durbin-Watson statistic was 1.98, meaning that the assumption of independent residual errors

was met (Durbin & Watson, 1951). The variance inflation factor (VIF) values as shown in Table 4.9, are all below 10 and the tolerance statistics are all above 0.2. Therefore, it is evident that multicollinearity between predictors is not problematic for this model (Field, 2013).

Table 4.9 Multicollinearity Diagnostic Statistics

	Collinearity Statistics	
Model	**Tolerance**	**VIF**
Self-efficacy	0.50	1.98
Self-regulation	0.33	2.96
Environmental determinants	0.41	2.43
Outcome expectations	0.49	2.01

The resulting model was significant (F = 75.246, $p = 0.002$) in predicting food safety behavioral intentions (Table 4.10). The significant independent variables in the model were self-regulation ($\beta = 0.467$, $p = 0.001$), environmental determinants ($\beta = 0.181$, $p = 0.011$), and outcome expectations ($\beta = 0.152$, $p = 0.018$) and they explained about 60.6 % of the variance in food safety behavioral intentions ($R^2 = 0.606$). Self-efficacy did not have a significant effect on food safety behavioral intentions ($\beta = 0.078$, $p = 0.219$).

Although self-efficacy was not predictive of food safety behavioral intentions, the direct relationship between all predictors and self-reported food safety behaviors was examined using multiple regression analysis and the results are presented in Table 4.11. The results showed that self-efficacy was a significant predictor of self-reported food safety behaviors ($\beta = 0.275$, $p = 0.003$).

Table 4.10 Multiple Regression Model for Predicting Food Safety Behavioral Intentions

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	15.663	4	3.916	75.246	0 .002*
Residual	10.200	196	0.052		
Total	25.863	200			

	Unstandardized Coefficients		Standardized Coefficients		
Model	***b***	***SE B***	***β***	**t**	**Sig.**
Constant	0.757	0.233		3.244	0.001
Self-efficacy	0.067	0.055	0.078	1.233	0.219
Self-regulation	0.477	0.079	0.467	6.048	0.001*
Environmental determinants	0.143	0.056	0.180	2.567	0.011*
Outcome Expectations	0.154	0.064	0.152	2.392	0.018*

Note. $*p < 0.05$

Table 4.11 Multiple Regression Model between all Predictors and Self-Reported Food Safety Behaviors

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	16.342	4	4.086	81.580	0.001*
Residual	9.816	196	0.050		
Total	26.158	200			

	Unstandardized Coefficients		Standardized Coefficients		
Model	***b***	***SE B***	***β***	**t**	**Sig.**
Constant	0.764	0.229		3.336	0.001
Self-efficacy	0.240	0.054	0.275	4.468	0.003*
Self-regulation	0.433	0.077	0.422	5.597	0.002*
Environmental determinants	0.123	0.055	0.154	2.250	0.026*
Outcome Expectations	0.046	0.063	0.045	0.728	0.468

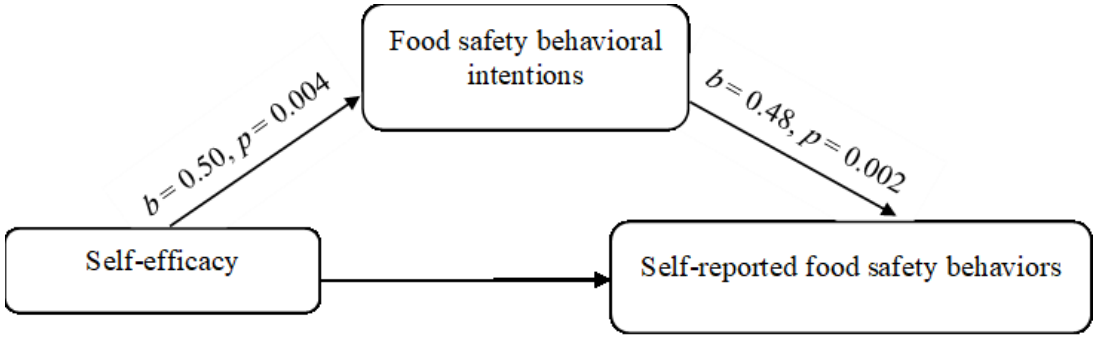
Note. $*p < 0.05$

Results of Mediation Analysis

The standardized indirect effects were computed based on 5,000 bootstrap samples for inference on the indirect effect of self-efficacy, self-regulation, outcome expectations and environmental determinants on self-reported food safety behaviors. Figure 4.1 illustrates the standardized regression coefficients for the relationship between self-efficacy and self-reported food safety behaviors as mediated by food safety behavioral intentions.

The results showed that there was a significant indirect effect of self-efficacy on self-reported food safety behaviors through food safety behavioral intentions, $b = 0.24$, CI [0.161, 0.336]. The 95% confidence intervals for the completely standardized indirect effect ranged from 0.189 to 0.377, indicating a mediation effect exists. The Sobel test results suggested that the relationship between self-efficacy and self-reported food safety behaviors is significantly mediated by food safety behavioral intentions ($z = 6.54$, $p = 0.001$).

Figure 4.1 Model of Self-Efficacy as a Predictor of Self-Reported Food Safety Behaviors, Mediated by Food Safety Behavioral Intentions

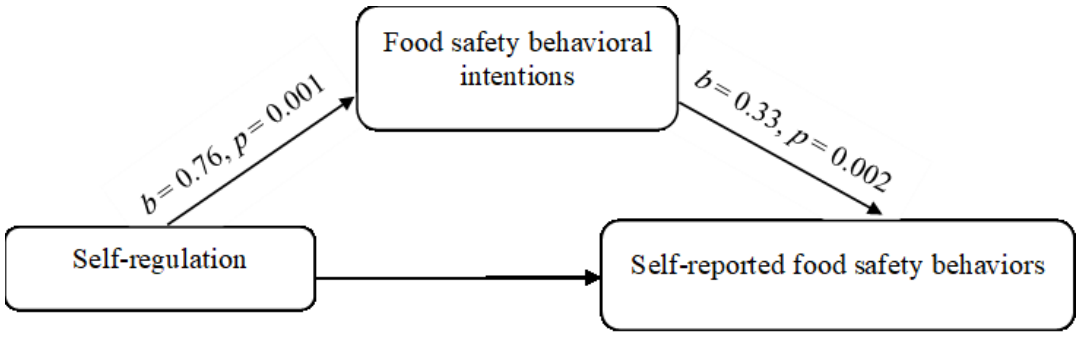


Direct effect, $b = 0.34$, $p = 0.001$

Indirect effect, $b = 0.24$, CI [0.161, 0.336]

The standardized regression coefficients for the relationship between self-regulation and self-reported food safety behaviors as mediated by food safety behavioral intentions are presented in Figure 4.2. The results of mediation analysis illustrated that there was a significant indirect effect of self-regulation on self-reported food safety behaviors through food safety behavioral intentions, $b = 0.252$, CI [0.155, 0.366]. The 95% bootstrap confidence intervals for the completely standardized indirect effect ranged from 0.152 to 0.353, suggesting a mediation effect exists. The Sobel test results also suggested that food safety behavioral intentions significantly mediate the relationship between self-regulation and self-reported food safety behaviors (z = 4.70, $p = 0.002$).

Figure 4.2 Model of Self-Regulation as a Predictor of Self-Reported Food Safety Behaviors, Mediated by Food Safety Behavioral Intentions



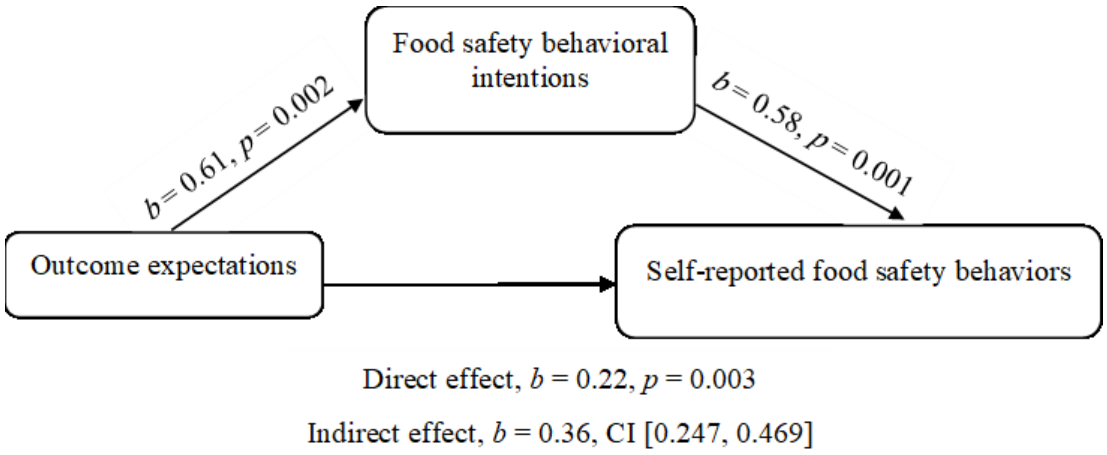
Direct effect, $b = 0.52$, $p = 0.004$

Indirect effect, $b = 0.25$, CI [0.155, 0.366]

Figure 4.3 presents the standardized regression coefficients for the relationship between outcome expectations and self-reported food safety behaviors as mediated by food safety behavioral intentions. The results of mediation analysis showed that there was a significant indirect effect of outcome expectations on self-reported food safety behaviors through food

safety behavioral intentions, $b = 0.355$, CI [0.247, 0.469]. The 95% bootstrap confidence intervals for the completely standardized indirect effect ranged from 0.250 to 0.451, indicating that a genuine mediation effect exists. The Sobel test results indicated that food safety behavioral intentions significantly mediate the relationship between outcome expectations and self-reported food safety behaviors (z = 7.05, $p = 0.002$).

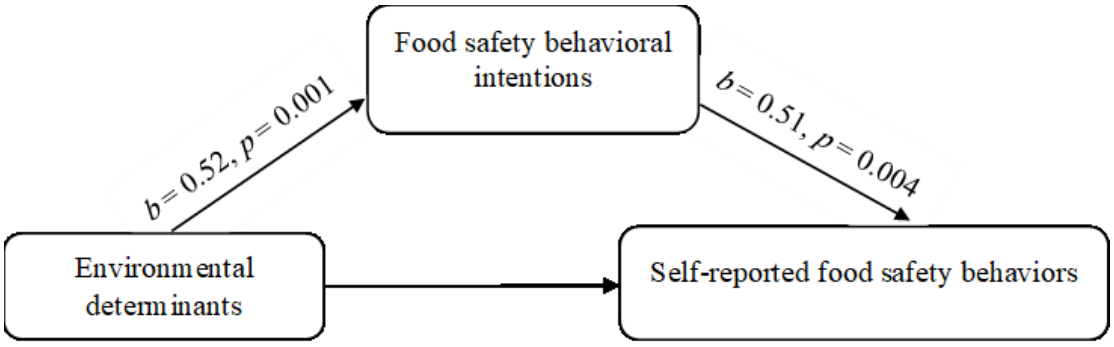
Figure 4.3 Model of Outcome Expectations as a Predictor of Self-Reported Food Safety Behaviors, Mediated by Food Safety Behavioral Intentions



The results of mediation analysis illustrated that there was a significant indirect effect of environmental determinants on self-reported food safety behaviors through food safety behavioral intentions, $b = 0.269$, CI [0.172, 0.393]. The 95% bootstrap confidence intervals for the completely standardized indirect effect ranged from 0.231 to 0.453, suggesting that a mediation effect exists. The Sobel test results indicated that food safety behavioral intentions significantly mediate the relationship between environmental determinants and self-reported food safety behaviors (z = 6.72, $p = 0.001$). Figure 4.4 illustrates the standardized regression

coefficients for the relationship between environmental determinants and self-reported food safety behaviors as mediated by food safety behavioral intentions.

Figure 4.4 Model of Environmental Determinants as a Predictor of Self-Reported Food Safety Behaviors, Mediated by Food Safety Behavioral Intentions



Direct effect, $b = 0.24$, $p = 0.002$

Indirect effect, $b = 0.27$, CI [0.172, 0.393]

Chapter 5 - Discussion

The current study was conducted to examine whether self-efficacy, self-regulation, outcome expectations, and environmental determinants, as constructs of the SCT, are predictive of self-reported food safety behaviors of food handlers in independent ethnic restaurants directly and indirectly through behavioral intentions. In this chapter, the results of the study were discussed and compared to previous research.

Discussion of Descriptive Statistics of the Model Constructs

Overall, for all constructs, respondents scored favorably. The self-efficacy scale mean score was 4.59 ± 0.41, indicating that respondents had relatively high self-efficacy regarding their confidence in their ability to perform the three investigated food safety behaviors; hand washing, proper handling of food and work surfaces, and use of a thermometer. The item *"use the thermometer at the completion of reheating food to 165°F"* had the lowest mean score though (4.46 ± 0.66). In a similar vein, Frash and MacLaurin (2010) measured self-efficacy on a seven-point Likert scale and found that the composite mean score for food safety self-efficacy of restaurants employees was high (5.75 ± 1.49).

The composite mean score for the construct of self-regulation was high (4.56 ± 0.35), suggesting that respondents had a good practice of self-monitoring, self-evaluation, and goal setting to ensure food safety. The item *"I evaluate myself when I use a food thermometer"* had the lowest mean score (4.40 ± 0.60).

Taken together, the respondents scored low in their self-efficacy and self-regulation regarding the use of a thermometer. This is consistent with Li (2015) who found that food thermometers are less used by food handlers in independent Chinese restaurants. Although the results of this study showed that food handlers had high self-efficacy and self-regulation, the

influence of their cultural tradition of food preparation is inevitable and can mingle with the business culture (Griffith, Livesey, & Clayton, 2010a). Previous research indicated that cultural tradition of foodservice employees in ethnic restaurants influence the extent to follow standard food safety practices (Harris et al., 2015). That was confirmed by the results of the focus group and group interviews as cultural background of employees as an influencer of the behaviors was one of the main themes that emerged.

The environmental determinants construct had a composite mean score of 4.65 ± 0.45. The item *"necessary infrastructure and equipment (e.g., hand washing sinks) are available and accessible to support food safety"* had the highest mean score (4.73 ± 0.34) and the item *"Sufficient financial resources are provided to support hygiene and food safety"* had the lowest mean score (4.50 ± 0.54). This result verifies the importance of providing appropriate equipment and supplies to follow proper food safety practices and highlights the lack of financial resources allocated to support food safety, especially in small, independent ethnic operations. This is consistent with Allwood, Jenkins, Paulus, Johnson, and Hedberg (2004), who found that proper handwashing of food workers was significantly associated with the availability of adequate physical infrastructure for handwashing. Several previous research also showed that lack of financial resources was a barrier to improve food safety in independent ethnic restaurants (Gould et al., 2013, Liu et al., 2014, Murphy et al., 2011, & Phillips et al., 2006). Liu and Lee (2017) indicated that the nature of most independent ethnic restaurants as small-scale businesses with limited resources can affect efforts to improve food safety. Similarly, Liu et al. (2014) identified lack of financial resources as one of the top barriers to providing food safety training in Chinese restaurants.

The construct of outcome expectations had a composite mean score of 4.59 ± 0.35, with the highest mean score (4.75 ± 0.35) for the item *"I will help protect my restaurant from liability for foodborne illnesses"* and the lowest mean score (4.38 ± 0.62) for the item *"my manager/supervisor will praise my performance."* This indicates that respondents perceived protecting their operations from liability as the most important positive outcome of performing proper hand washing, handling of food and work surfaces, and use of a thermometer. This finding matches the result of the focus group and group interviews that reducing risk of foodborne illnesses, avoiding lawsuits, and maintaining good reputation was one of the subthemes that emerged from the discussion. Therefore, educating food handlers on the consequences of improper practices can improve their attitude towards food safety (Howells et al., 2008). McAlister et al. (2008) argued that the SCT posits that a behavior can be affected by one's anticipation of how they will feel about themselves if they do or do not perform that behavior. Thus, educating food handlers about the positive outcomes of performing food safety behaviors would act as an incentive to follow proper food safety practices to protect themselves and their operation from liability.

The composite mean score of the food safety behavioral intentions construct was 4.62 ± 0.36. The highest mean score (4.79 ± 0.30) was for the item *"I am willing to separate raw food from ready-to-eat food during preparation"* and the lowest mean score (4.45 ± 0.58) was for the item *"I intend to use a food thermometer at the completion of cooking"*. This result suggested that respondents had high intention to perform proper handling of food and less intention to use a food thermometer. This may be attributed to employees' cultural influence by using their own methods to check the doneness of cooking or having less time to check the temperature of food. Similarly, Pilling, Brannon, Shanklin, Howells, and Roberts (2008) used a seven-point Likert

scale to measure behavioral intention and found that foodservice employees in the investigated restaurants had less intention to use a thermometer (6.20 ± 1.16), when compared with sanitizing surfaces (6.57 ± 1.16) and handwashing (6.48 ± 0.96).

The composite mean score for self-reported food safety behaviors was 4.62 ± 0.36. The items *"I wash my hands after sneezing, coughing, or using a tissue"* and *"I wash my hands before and after handling raw food"* had the highest mean score, 4.85 ± 0.23 and 4.84 ± 0.25, respectively. The items *"I use a thermometer to check the temperature of food at the completion of cooking"* and *"I use a thermometer to check the temperature of food at the completion of reheating"* had the lowest mean scores, 4.46 ± 0.61 and 4.42 ± 0.66, respectively. Although respondents scored favorably in all behaviors, they scored low in the use of a thermometer at the completion of cooking and reheating. This could be attributed to lack of motivation, lack of risk perception, lack of time, and/or unavailability of food thermometers (Li, 2015). Cultural tradition of food preparation may have an influence on performing proper food safety practices including handwashing, time and temperature control, and proper handling of food and contact surfaces (Kwon et al. 2010). Dharod et al. (2007) investigated self-reported and observed food handling behaviors of Hispanic food handlers in a home setting and found that 47% of participants reported being confident of their own method for determining cooking doneness and 28% of them mentioned that inability to use a thermometer was a reason for not using it.

Discussion of the Hypotheses Testing Results

A multiple regression analysis was conducted to test the hypotheses (Hypothesis 1, 2, 3, and 4) related to whether self-efficacy, environmental determinants, outcome expectations, and self-regulation are predictive of food safety behavioral intentions. Mediation analysis was performed to test Hypothesis 5 related to whether food safety behavioral intentions mediate the

relationship between the four constructs of the SCT and self-reported food safety behaviors. Discussion of the results concerning each of the five proposed hypotheses are outlined below.

H_1: Self-efficacy is predictive of food safety behavioral intentions

The findings showed that self-efficacy is not a significant predictor of food safety behavioral intentions ($\beta = 0.078$, $p = 0.219$). Therefore, Hypothesis 1 was not supported. This finding was contradictory to the finding of Chow and Mullan (2010). In their research using a sample of 259 participants, they found that self-efficacy had a significant and direct impact on food safety behavioral intentions ($\beta = 0.176.$, $p = 0.003$). It should be noted, however, that the approach of Chow and Mullan (2010) was different, as they used the Health Action Process Approach (HAPA) to predict food safety behavior of a relatively larger sample of undergraduates. This finding was also inconsistent with Yazdanpanah et al. (2015) who found that self-efficacy had a positive direct relationship with behavioral intentions toward water conservation behavior ($\beta = 0.55$, $p < 0.000$).

However, the results of multiple regression analysis of the relationship between self-efficacy, self-regulation, environmental determinants, and outcome expectations as predictors and self-reported food safety behaviors as a dependent variable indicated that self-efficacy was a significant predictor of self-reported food safety behaviors ($\beta = 0.275$, $p = 0.003$). This finding suggested that employees' high level of self-efficacy could be translated directly to positive self-reported behaviors. For instance, Beavers et al. (2015) investigated the relationship between adolescents' self-efficacy and their food safety behavioral change across three administrations of educational interventions. Using a sample of 424 students across six states, they found that self-efficacy was the only significant predictor of behavior change ($\beta = 0.421$, $P < 0.001$). Bandura (1977, 1986), indicated that individuals with greater perception of their self-efficacy are more likely to perform challenging behaviors compared to those with low self-efficacy perception.

Kretzer and Larson (1998) and Mitchell et al. (2007) also pointed out that individuals' perception of self-efficacy accounts for the level of effort and persistence to perform a specific behavior. Thus, it is evident that self-efficacy can directly influence a person's behavior and does not necessarily induce their behavioral intention.

H_2: Environmental determinants are predictive of food safety behavioral intentions

The results indicated that environmental determinants, including both physical and social factors, significantly predicted food safety behavioral intentions of the respondents ($\beta = 0.181$, $p = 0.011$). Therefore, Hypothesis 2 was supported.

On one hand, this finding confirmed the importance of the adequacy of necessary equipment and access to resources to follow safe food handling practices in the investigated restaurants. On the other hand, this finding suggested that lack of necessary infrastructure and equipment can hinder food handlers from performing proper food safety behaviors. For instance, York et al. (2009), investigated restaurant employees' beliefs about food safety. They found that lack of access to resources was among the most frequently reported barriers to handwashing, use of a thermometer, and proper handling of food and contact surfaces. Strohbehn et al. (2014) assessed the perception of foodservice employees of barriers that influence their food safety behaviors. They found that lack of supplies like gloves and alcohol wipes was a major barrier to performing proper food safety behaviors. The finding also suggested the importance of social support represented in the role that managers/supervisors can play to motivate their employees to follow proper food safety behaviors. Howells et al. (2008) examined restaurant employees' perception of barriers to perform proper food safety practices and argued that managers can support proper food safety behaviors by acting as role models and giving their employees verbal reminders and praise for following proper practices. Thus, interventions aimed at increasing food

handlers' intentions to follow proper food safety practices may take advantage of focusing on increasing social support from peers and managers to prepare food safely and foster confidence in those who feel they are ill equipped to perform behaviors properly (Fulham & Mullan, 2011).

H_3: Outcome expectations are predictive of food safety behavioral intentions

Hypothesis 3 was supported. The results showed that outcome expectations, represented in the respondents' beliefs about anticipated outcomes of carrying out a behavior, significantly influence their food safety behavioral intentions ($\beta = 0.152$, $p = 0.018$). Similarly, Wen and Kwon (2017) investigated perceived risks and risk communication behaviors of restaurant servers related to serving customers with food allergy. They found that perceived severity of food allergy reactions ($\beta = 0.133$, $p < 0.001$) was a significant predictor of restaurant servers' allergy risk reduction and communication behaviors. Unlike the study by Roseman and Kurzynske (2006), which focused on consumers' perceived susceptibility to their own food safety risks and behaviors, this finding suggested that employees' outcome expectations regarding the potential risks of poor food handling behaviors on the customers and the reputation of their operation can stimulate intentions to perform proper food safety behaviors.

This finding also suggested that the more a food handler feels their food safety behaviors are self-rewarding, in terms of feeling a sense of accomplishment, then the greater their intention will be to adhere to proper food safety behaviors. Therefore, educating food handlers on the consequences of improper food safety behaviors by using persuasive messages is an important step to improve their behaviors (Howells et al., 2008).

H_4: Self-regulation is predictive of food safety behavioral intentions

The findings indicated that self-regulation is significantly predictive of food safety behavioral intentions of the respondents ($\beta = 0.467$, $p = 0.001$). Therefore, Hypothesis 4 was supported.

This finding implied that food handlers who reported monitoring their food safety practices, setting goals, and evaluating their performance were more likely to have a sustained intention to perform proper behaviors and it is consistent with the views of Bandura (2005) and Zimmerman (2000). Thus, the more food handlers engage in self-regulation, the more they will be able to self-control their behavior, especially if they perform it in a supportive environment (Hall & Fong, 2007). This finding also suggested that self-regulation may create motivational influence on the formation of food handlers' intentions to follow safe food handling behaviors. Similar results were reported by Allom and Mullan (2012), who used the Theory of Planned Behavior with the addition of the self-regulation variable to explore factors which influence healthy eating practices. Utilizing a sample of 209 university students, they found that students with high self-regulatory ability were more likely to consume fruits and vegetables ($F_{1,208} = 5.25$, $p = 0.02$). Although this study focused on the social-cognitive facets of self-regulation, previous research that investigated the biological differences between people in their ability to self-regulate their behaviors reported similar results (Hall & Fong, 2007; Hall et al., 2008). For instance, Hall et al. (2008) investigated the addition of self-regulation variable to the Theory of Planned Behavior in explaining exercise and diet behaviors. They found that individual differences in neurocognitive self-regulation represented in executive function or operations of the brain that control a behavior explained a significant proportion of variance in exercise behavior (59%) and dietary behavior (61%).

H_5: Self-reported food safety behaviors are mediated by food safety behavioral intentions

The results of mediation analysis showed that behavioral intentions significantly mediate the relationships between self-efficacy and self-reported food safety behaviors (b = .24, CI [0.161, 0.336], self-regulation and self-reported food safety behaviors (b = 0.252, CI [0.155, 0.366]), outcome expectations and self-reported food safety behaviors (b = 0.355, CI [0.247, 0.469]), and environmental determinants and self-reported food safety behaviors (b = 0.269, CI [0.172, 0.393]). Therefore, Hypothesis 5 was supported.

These findings are consistent with the view of Bandura (1986), who noted that most behaviors are mediated by behavioral intentions. These findings suggested that food handlers' intention to perform food safety behaviors can lead to better compliance with the behaviors when self-efficacy, self-regulation, outcome expectations, and environmental determinants are favorable to the behaviors. Similarly, Yazdanpanah et al. (2015) examined factors influencing water conservation intention and behavior using the constructs of the SCT. They found that self-efficacy had a strong indirect effect on the behavior through behavioral intentions (β = 0.22) and outcome expectations had a moderate indirect effect on the behavior (β = 0.13). Therefore, providing adequate resources and reminders to the employees to perform the behaviors (Pilling, Brannon, Shanklin, Howells, & Roberts, 2008), building up their confidence to perform the behaviors (Fulham & Mullan, 2011), stressing that bosses, coworkers, customers, and health inspectors want them to follow proper food safety practices (Pilling, Brannon, Shanklin, Howells, & Roberts, 2008), and encouraging employees to self-regulate themselves can increase their intention and consequently engage in proper food safety behaviors.

Chapter 6 - Conclusion

In this chapter, major findings of testing the hypotheses are summarized. Theoretical and practical implications and recommendations for future research are presented at the end of this chapter.

Major Findings

Multiple linear regression analysis was combined with mediation analysis to test the hypotheses. Results of the hypotheses testing are summarized below.

H_1: Self-efficacy is predictive of food safety behavioral intentions

Hypothesis one was not supported. The results indicated that self-efficacy is not a significant predictor of food safety behavioral intentions ($\beta = 0.078$, $p = 0.219$). This result was inconsistent with Chow and Mullan (2010) who found that action self-efficacy had a significant impact on food safety behavioral intentions ($\beta = 0.176.$, $p = 0.003$) and Yazdanpanah et al. (2015) who found that self-efficacy was a significant predictor of behavioral intentions toward water conservation behavior ($\beta = 0.55$, $p < 0.000$).

H_2: Environmental determinants are predictive of food safety behavioral intentions

Hypothesis two was supported. The results showed that environmental determinants, including both physical and social factors are significantly predictive of food safety behavioral intentions of the respondents ($\beta = 0.181$, $p = 0.011$). Similarly, Strohbehn et al. (2014) and York et al. (2009) found that unsupportive environment represented in lack of access to resources and supplies influenced employees' adherence to proper food safety behaviors.

H_3: Outcome expectations are predictive of food safety behavioral intentions

Hypothesis three was supported. The results indicated that outcome expectations regarding beliefs about anticipated outcomes of carrying out a behavior significantly influence

food safety behavioral intentions ($\beta = 0.152$, $p = 0.018$). Similar results were reported by Tudoran et al. (2012), who found that outcome expectations in terms of avoidance of negative consequences of a behavior had a significant interactive effect with self-efficacy on the behavioral intention to eat healthy food.

H_4: Self-regulation is predictive of food safety behavioral intentions

Hypothesis four was supported. The results showed that self-regulation is significantly predictive of food safety behavioral intentions of the respondents ($\beta = 0.467$, $p = 0.001$). This finding was consistent with the views of Bandura (2005) and Zimmerman (2000) that self-regulation is essential to sustain the behavior and prevent behaviors that are inconsistent with one's goals.

H_5: Self-reported food safety behaviors are mediated by food safety behavioral intentions

Hypothesis five was supported. The results indicated that behavioral intentions are a significant mediator of the relationships between self-efficacy and self-reported food safety behaviors ($b = 0.24$, CI [0.161, 0.336]), self-regulation and self-reported food safety behaviors ($b = 0.252$, CI [0.155, 0.366]), outcome expectations and self-reported food safety behaviors ($b = 0.355$, CI [0.247, 0.469]), and environmental determinants and self-reported food safety behaviors ($b = 0.269$, CI [0.172, 0.393]). Yazdanpanah et al. (2015) similarly found that behavioral intentions significantly mediate the relationship between self-efficacy and water conservation behavior ($\beta = 0.22$) and outcome expectations and water conservation behavior ($\beta = 0.13$).

Theoretical Implications

This study used the constructs of the Social Cognitive Theory (SCT), self-efficacy, self-regulation, outcome expectations, and environmental determinants, to predict self-reported food

safety behaviors in independent ethnic restaurants. Although the SCT has been widely used in the development of programs and interventions to behaviors in the health field, little has been done using the SCT to predict self-reported food safety behaviors, especially in independent ethnic restaurants. Unlike previous research in the hospitality area, which used sole constructs of the SCT like self-efficacy to investigate employees' career commitment (Niu, 2010) or employees' performance (Reynolds, 2002), this study used a full model using four constructs of the SCT to investigate self-reported food safety behaviors.

The number of studies using the SCT in the commercial foodservice setting is limited. This study is among the first attempts to develop a reliable and valid scale to measure the constructs of the SCT. The developed scale may encourage future studies to advance the theory and yield theoretical and practical implications to improve food safety behaviors in different settings in the foodservice industry.

This study followed a sequential mixed-method approach using focus group and group interviews and a survey instrument. The combination of both qualitative and quantitative approaches allowed to gain a broader, more complete understanding of food safety behaviors which is complex and hard to investigate accurately with one approach. In addition, triangulation enabled the weaknesses of one approach to be complemented by the strengths of the other. The results of the focus group and group interviews highlighted several other factors along with the social cognitive factors that influence food safety behaviors in independent ethnic restaurants. These results can guide future studies to use a holistic approach to investigate food safety behaviors.

The hypothesized model in this study was significant in predicting food safety behavioral intentions ($F = 75.246$, $p = 0.002$) and explained about 60.6% of the variance in food safety

behavioral intentions. This was comparable to the results of similar studies using the constructs of the SCT (Stacey et al., 2015).

This study investigated the ways in which the constructs act alone and together to influence behavioral intentions and self-reported food safety behaviors. Therefore, the results of this study are important in expanding our knowledge of the social cognitive constructs that influence food handlers' behavioral intentions and self-reported food safety behaviors in independent ethnic restaurants. This study is a critical addition to the food safety literature in aiding developers of educational interventions and training programs to effectively target psychological and environmental constructs that are ignored by other health behavior theories like the Theory of Planned Behavior.

Practical Implications

Investigating the predictability of the SCT constructs to self-reported food safety behaviors in independent ethnic restaurants will enable developers of educational interventions and training programs to more effectively target psychological and environmental constructs that will lead to positive food safety practices. The results of this study can be used by public health officials and food safety professionals to help owners, managers, and supervisors identify better ways to communicate positive food safety practices with food handlers in independent ethnic restaurants. The following are recommendations for public health officials and operators of independent ethnic restaurants based on the results of this study:

- Public health officials and developers of educational interventions and training programs should consider targeting food handlers' self-efficacy, self-regulation, outcome expectations, and environmental determinants in the workplace that influence food safety behaviors when developing training materials.

- The focus group and group interview results highlighted the influence of cultural background on food safety behaviors. To support a positive organizational culture of food safety, public health officials should consider the influence of cultural background of employees in independent ethnic restaurants when developing training materials.
- Owners, managers, and supervisors should educate their food handlers on the consequences of improper food safety behaviors by using persuasive messages as an attempt to improve their behaviors or continue to perform proper food safety behaviors. These messages can be expressed verbally or in the form of posters in the spoken language of the food handlers.
- To increase food handlers' intentions to follow proper food safety practices, operators and managers in independent ethnic restaurants should focus on increasing social support among employees to prepare food safely and build up confidence in those who feel they are ill equipped to perform behaviors properly.
- The results indicated that self-efficacy was not a significant predictor of behavioral intentions, yet a significant predictor of self-reported food safety behaviors. Therefore, operators in independent ethnic restaurants need to support food handlers' self-efficacy by telling the person that he or she can perform the proper behavior. Consistent encouragement can reinforce confidence enough to bring about more efforts toward improving food safety behaviors. Also, observing managers, supervisors, and coworkers performing successfully can raise self-efficacy.
- Operators of independent ethnic restaurants should motivate their food handlers to follow self-regulation strategies like monitoring their food safety practices, setting goals, and

evaluating their performance to gain a sustained intention to perform proper behaviors through time.

Recommendations for Future Research

The Social Cognitive Theory is relatively broad and therefore, to test the theory more comprehensively, other constructs in the theory like observational learning need to be included with other constructs and measured in experiments replicated over diverse food safety behaviors. Future research is encouraged to use different designs for the study (e.g. experimental design) to determine which construct is useful or feasible for each behavior and to design interventions to promote proper food safety behaviors in independent ethnic restaurants.

Albert Bandura, the developer of the Social Cognitive Theory, indicated that the underlying premise of the theory is that environmental, personal, and other behavioral factors interact to influence one another in a bidirectional process (Bandura, 1999). Although this study investigated whether self-efficacy, outcome expectations, and self-regulation are predictive of food safety behavioral intentions and self-reported food safety behaviors, the interaction that exists between the characteristics of a person, their behaviors, and their environment was not explored, and it is still a promising area for future research.

The results of this study did not show a statistically significant relationship between self-efficacy and food safety behavioral intentions. To better understand the relationship between food safety self-efficacy and behavioral intentions, further research is needed to investigate this relationship using a larger sample. The measurement scale in this study showed good reliability and validity, future research should attempt to use a larger sample to verify validity even though it would be challenging to be attainable using an on-site survey instrument. Given that the sample of this study was limited to food handlers in independent Chinese and Mexican

restaurants in three counties in Kansas, results cannot be generalized to other foodservice operations such as other independent ethnic restaurants, schools, healthcare, and university foodservice. It would be important for future studies to replicate the study in other foodservice settings and involve other employees like servers who might influence food safety.

Finally, the role of ethnicity was not examined in this study due to lack of ethnic diversity in the study sample. Future studies utilizing a sample that represents a wider range of ethnic background are encouraged and would be more effective at measuring differences in food safety behaviors based on ethnicity of food handlers, if such differences exist.

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Appendix A - Focus Group and Group Interview Screening Script and Protocol

Hi. This is [Interviewer's name] from the Department of Hospitality Management at Kansas State University. May I please speak with the manager?

[READ]: Hi [Insert Manager's/owner's name if known]. This is [Interviewer's name] I am calling from the Department of Hospitality Management at Kansas State University.

I am conducting a study to investigate food safety behavior in independent ethnic restaurants and I am trying to recruit and sign-up food handlers to participate in a focus group interview. A focus group is where 6-10 people come together and share their opinions and ideas related to the topic at hand. I am asking your assistance and approval to recruit food handlers from your operation for this study.

[If YES, I will send you a sign-up sheet so that employees who are interested can sign up]

[If NO, thank them for their time and hang up]

Appendix B - Focus Group and Group Interview Recruitment Flyer and Sign-up Sheet

Do you want to earn $20 cash?

If you are a food handler and have worked or you currently work in a Mexican or Chinese restaurant, sign up to participate in a 60-minute focus group interview discussing food safety behavior in independent ethnic restaurants

No identifiable information will be shared with any other party or person and participants may choose pseudonyms. Your responses will be confidential, and all data will be reported as group data.

Each participant will get $20 cash as a token of appreciation for their participation

If you are interested in participating in this study, please use this link below, scan the QR code, or just call me to sign up
https://tinyurl.com/focusgroup123

Must be 18 years old or older
For more information, contact Basem Boutros at email; phone number

¿Quieres ganar $ 20 en efectivo?

¿Eres trabajador de alimentos y has trabajado o trabajas actualmente en un restaurante mexicano? Regístrese para participar en una entrevista grupal de 60 minutos sobre el comportamiento de seguridad alimentaria en restaurantes étnicos independientes

La información proporcionada será confidencial y anónima. A usted no se le identificará por nombre o lugar de trabajo

Recibirá $ 20 en efectivo como muestra de agradecimiento por su participación

Si está interesado en participar en este estudio, siga este enlace, escanee el código QR o simplemente llámeme

https://tinyurl.com/focusgroup123

Debe tener 18 años o más

Para mas informacion contacte Basem Boutros at email; phone number

你想赚 20 美元的现金？

如果您曾经工作过，或者您目前在中国餐馆工作，请注册参加 60 分钟的小组面试，讨论独立民族餐厅的食品安全行为

您将获得 20 美元现金作为您参与的评价.

没有可识别的信息将与任何其他人分享，参与者可以选择假名

您的信息绝对保密，只会用于学术文献。

如果您有兴趣参与此研究，请扫描 QR 码，关注链接或致电我

https://tinyurl.com/focusgroup123

必须年满 18 岁或以上

欲了解更多信息，请联系 Basem Boutros, email; phone number

Name	Phone number	Email address

Appendix C - Focus Group and Group Interview Questions

Type of question	Question
Opening	○ Can you tell me how long you have been working in your restaurant/foodservice industry?
Introductory	○ When you think of food safety behavior, what is the first thing that comes to your mind?
Transition	○ Think back to when you started your job as a food handler, what factors would you say influenced your food safety behavior?
Key questions	• **Self-efficacy** ○ How confident are you about washing hands? ○ **Probe:** Can you explain how to wash your hands properly? ○ To what extent do you feel confident in your ability to clean and sanitize food contact surfaces? ○ **Probe:** When should you clean and sanitize food contact surfaces? ○ To what extent do you feel confident in your ability to use a food thermometer? ○ **Probe:** How do you use the thermometer to check the temperature of the food? • **Self-regulation** ○ What goals do you have in mind when you prepare/cook the food? ○ Do you self-monitor your food handling practices? ○ **Probe:** How did you learn these self-regulation strategies? • **Outcome expectations** ○ What are some advantages related to performing proper hand washing/ using a thermometer/ proper handling of food and work surfaces? ○ **Probe:** What are some reasons why you would want to carry out these food safety behaviors? ○ What are some disadvantages related to performing hand washing/ using a thermometer/ proper handling of food and work surfaces? ○ **Probe:** What are some reasons why you think there could be disadvantages from performing these food safety behaviors? • **Environmental determinants** ○ What factors in your workplace would make it easier for you to perform these behaviors? ○ What factors in your workplace would make it difficult to perform these behaviors? ○ **Probe:** Can you think about physical and/or social factors? • **Behavioral intention** ○ Can you tell me about your intentions to carry out hand washing/using a thermometer/proper handling of food and work surfaces in the past two weeks?

	○ **Probe:** If you intend to perform proper food safety behaviors, what would your plan look like?
Transition	○ What practices do you perform to ensure safe handling or preparation of food?
Key question	• **Food safety behavior** ○ When do you wash your hands in a typical work day? ○ When do you use a thermometer? ○ What practices do you perform to ensure proper handling of food and work surfaces?
Ending question	○ Do you have anything else you would like to share that we haven't discussed?

Tipo de pregunta	Pregunta
Apertura	○ ¿Puedes decirme cuánto tiempo lleva trabajando en el restaurante?
Introductorio	○ Cuando piensas en el comportamiento de inocuidad de los alimentos, ¿qué es lo primero que se te viene a la cabeza?
Transición	○ Recuerda cuando comenzaste tu trabajo como manipulador de alimentos, ¿qué factores dirías que influyeron en tu comportamiento sobre inocuidad de los alimentos?
Preguntas clave	• **Autoeficacia** ○ ¿Qué tan confidente (seguro) se siente sobre lavarse las manos? ○ **Pregunta de profundidad:** ¿Puede explicarme cómo lavarse las manos correctamente? ○ ¿En qué medida se siente seguro de su capacidad para limpiar y desinfectar las superficies en contacto con los alimentos? ○ **Pregunta de la sonda:** ¿Cuándo debe limpiar y desinfectar las superficies en contacto con los alimentos? ○ ¿En qué medida se siente seguro de su capacidad para usar un termómetro de los alimentos? ○ **Pregunta de la sonda:** ¿Cómo se usa el termómetro para verificar la temperatura de los alimentos? • **Auto-regulación** ○ ¿Qué metas tiene en mente cuando prepara/cocina los alimentos? ○ ¿Usted auto-supervisa sus prácticas sobre manipular los alimentos? ○ **Pregunta de profundidad:** ¿Cómo aprendió estas estrategias de auto-supervisión? • **Expectativas de resultado** ○ ¿Cuáles son algunas ventajas relacionadas con realizar un lavado de manos / usar un termómetro / manejo adecuado de alimentos y superficies de trabajo? ○ **Pregunta de profundidad:** ¿Cuáles son algunas de las razones por las que querría llevar a cabo estos comportamientos sobre inocuidad de los alimentos? ○ ¿Cuáles son algunas desventajas relacionadas con la realización de lavado de manos / uso de un termómetro / manejo adecuado de alimentos y superficies de trabajo? ○ **Pregunta de profundidad:** ¿Cuáles son algunas de las razones por las que cree que podría haber desventajas al realizar estos comportamientos sobre inocuidad de los alimentos? • **Determinantes ambientales** ○ ¿Qué factores en su lugar de trabajo le facilitarían realizar estos comportamientos? ○ ¿Qué factores en su lugar de trabajo harían difícil realizar estos comportamientos?

	○ **Pregunta de profundidad:** ¿Puede pensar en factores físicos y / o sociales? • **Intención de comportamiento** ○ ¿Puede decirme sobre sus intenciones de lavarse las manos en las últimas dos semanas? ○ ¿Puede decirme sobre sus intenciones de usar un termómetro en las últimas dos semanas? ○ ¿Puede decirme sobre sus intenciones de realizar un manejo adecuado de alimentos y superficies de trabajo en las últimas dos semanas? ○ **Pregunta de profundidad:** Si tiene la intención de llevar a cabo comportamientos sobre la inocuidad de los alimentos, ¿cómo planea hacerlo?
Transición	○ ¿Qué prácticas realiza para garantizar una manipulación o preparación segura de los alimentos?
Pregunta clave	• **Comportamiento sobre inocuidad de los alimentos** ○ ¿Cuándo se lava las manos en un día típico de trabajo? ○ ¿Cuándo usa un termómetro? ○ ¿Qué prácticas realiza para garantizar un manejo adecuado de los alimentos y las superficies de trabajo?
Pregunta final	○ ¿Tiene algo más que le gustaría compartir que no hemos discutido?

问题类型	Question
开始	○ 你能告诉我你在餐厅/食品服务行业工作了多久？
介绍	○ 当你想到食品安全行为时，首先想到的是什么？
过渡	○ 回想一下，当你开始作为食品处理员工作时，你认为哪些因素会影响你的食品安全行为？
关键问题	• **自我效能** ○ 你对洗手有多自信？ ○ **探查:** 你能解释一下如何正确洗手吗？ ○ 您对自己清洁和消毒食品接触表面的能力有多大程度的自信？ ○ **探查：什么时候应该清洁和消毒食品接触表面？** ○ 您对使用食物温度计的能力有多大程度的自信？ ○ **探查：你如何使用温度计来检查食物的温度？** • **自我调节** ○ **准备/烹饪食物时你有什么目标？** ○ 您是否自行监控您的食物处理操作？ ○ **探查:** 你是如何学习这些自我调节策略的？ • **结果预期** ○ 进行适当的洗手/使用温度计/正确处理食物和工作表面有什么相关的好处？ ○ **探查:** 你进行这些食品安全行为的原因是什么？ ○ 与进行适当的洗手/使用温度计/正确处理食物和工作表面有什么相关的坏处？ ○ **探查:** 你认为不执行这些食品安全行为可能存在坏处的原因是什么？ • **环境决定因素** ○ 你工作场所中的哪些因素会使你更容易执行这些行为？ ○ 您工作场所中的哪些因素会导致难以执行这些行为？ ○ **探查:** 请考虑有哪些物质和/或社会因素？ • **行为意图** ○ 您能否告诉我您在过去两周内进行洗手/使用温度计/正确处理食物和工作表面的意图？ ○ **探查:** 如果你打算进行适当的食品安全行为，你的计划是什么？
过渡	○ 您采取了哪些做法来确保安全处理或准备食物？
关键问题	• **食品安全行为** ○ 在平常的工作日，你什么时候洗手？ ○ 你什么时候使用温度计？ ○ 您采取了哪些做法来确保正确处理食物和工作表面？
结束问题	○ 您还有什么想分享的东西，我们没有讨论过？

Appendix D - Focus Group and Group Interview Consent Form

KANSAS STATE UNIVERSITY | Department of Hospitality Management

Informed Consent Form for Participation

Study Title: Self-reported Food Safety Behavior in Independent Ethnic Restaurants: An Application of the Social Cognitive Theory

Principal Investigator: Kevin R. Roberts, Ph.D.
Co-investigator: Basem A. Boutros, M.S.

I. Purpose

The purpose of this study is to investigate self-reported food safety behaviors in independent ethnic restaurants using the Social Cognitive Theory.

II. Procedures

Your participation requires you to attend a focus group interview. Your participation will require you to answer questions about your food safety behavior in your operation. The focus group interview will take approximately 60 minutes to complete. Discussion among other members in the group is encouraged. The Kansas State University Institutional Review Board has approved this study.

III. Risks

There is no identifiable risk. The only foreseeable risk is the possible inconvenience associated with answering the focus group questions. You do not have to answer any questions that make you feel uncomfortable and you may withdraw at any time.

IV. Benefits

You will have the chance to experience and understand the process involved in focus group interviews. The findings from this study will have a practical value, providing a framework for both theoretical developments and practical interventions to target more effectively factors that contribute to proper food safety behaviors.

V. Confidentiality

The researcher will audio record the focus group interview. The recordings will be converted to computer audio format (MP3) and be saved to a password protected computer. The researcher will transcribe the information and compile a report. No identifiable information will be shared with any other party or person and participants may choose pseudonyms. The researcher will audio record your responses to the questions without identifying the answers with the person in the final report. The data collected will be stored for 3 years or until the research is published, then destroyed.

VI. Compensation

You will receive $20 cash as a token of appreciation for your participation.

VII. Withdraw

Your participation is completely voluntary. If you decided not to participate in this study, you may withdraw your consent at any time, and stop participating at any time without explanation, penalty, or loss of benefits.

VIII. Subject's Permission

I verify that my signature below indicates that I have read and understand this consent form, and willingly agree to participate in this study under the terms described, and that my signature acknowledges that I have received a signed and dated copy of this consent form.

Participant Name: _____ **Social Security Number:** _____

Participant Signature: _____ **Date:** _____

Investigator Signature: _____ **Date:** _____

Should you have any questions about the study, please contact Basem Boutros at (785) xxx- xxxx or Dr. Kevin Roberts at (785) 532- 2399. If you have any questions about the rights of individuals in this study or about the way it is conducted, you may contact Dr. Rick Scheidt, Chair of the Committee on Research Involving Human Subjects, (785) 532-3224, 203 Fairchild Hall, Kansas State University, Manhattan, KS 66506. Thank you so much for your time and assistance.

KANSAS STATE UNIVERSITY | Department of Hospitality Management

Formulario de Consentimiento de Participacion

Título del estudio: Comportamiento auto-informado sobre inocuidad de los alimentos en restaurantes étnicos independientes: Una aplicación de la Teoría Cognitiva Social

Investigador principal: Kevin R. Roberts, Ph.D.
Co-investigadores: Basem Boutros, M.S.

I. Propósito
El objetivo de este estudio es investigar los comportamientos auto-informados sobre inocuidad de los alimentos en restaurantes étnicos independientes utilizando la Teoría Cognitiva Social.

II. Procedimientos
Su participación requiere que asista a una entrevista grupal. Su participación requerirá que responda preguntas sobre su comportamiento sobre inocuidad de los alimentos en su operación. La entrevista grupal tardará aproximadamente 60 minutos en completarse. Se fomenta la discusión entre otros miembros del grupo. El Comité de Investigación con la Participación de Seres Humanos de la Universidad Estatal de Kansas ha aprobado este estudio.

III. Riesgos
No hay un riesgo identificable. El único riesgo previsible es la posible inconveniencia asociada con la respuesta a las preguntas del grupo focal. No tiene que responder ninguna pregunta que lo haga sentir incómodo y puede retirarse en cualquier momento.

IV. Beneficios
Tendrás la oportunidad de experimentar y comprender el proceso involucrado en las entrevistas grupales. Los resultados de este estudio tendrán un valor práctico, proporcionando un marco para los desarrollos teóricos y las intervenciones prácticas para facilitar de manera más efectiva los factores que contribuyen a los comportamientos adecuados sobre la inocuidad de los alimentos.

V. Confidencialidad
El investigador grabará la entrevista del grupo focal. Las grabaciones se convertirán al formato de audio de computadora (MP3) y se guardarán en una computadora protegida con contraseña. El investigador transcribirá la información y compilará un informe. Los datos recopilados se almacenarán durante 3 años o hasta que la investigación se publique y luego se destruirán. La información proporcionada será confidencial y anónima. A usted no se le identificará por nombre o lugar de trabajo.

VI. Compensación
Recibirá $ 20 en efectivo como muestra de agradecimiento por su participación.

VII. Retiro
Su participación es completamente voluntaria. Si decidió no participar en este estudio, puede retirar su consentimiento en cualquier momento y dejar de participar en cualquier momento sin explicación, sanción o pérdida de beneficios.

VIII. Permiso del Participante
Verifico que mi firma, a continuación, indica que he leído y entiendo este formulario de consentimiento, y acepto voluntariamente participar en este estudio bajo los términos descritos, y que mi firma reconoce que he recibido una copia firmada y fechada de este formulario de consentimiento.

Nombre del Participante: _____ **Número de seguro social:** _____

Firma del Participante: _____ **Fecha:** _____

Firma del Testigo: (Personal del Proyecto) _____ **Fecha:** _____

Si tiene alguna pregunta sobre el estudio, comuníquese con Basem Boutros al (785) xxx-xxxx o con el Dr. Kevin Roberts al (785) 532-2399. Si tiene alguna pregunta sobre los derechos de las personas en este estudio o sobre el camino se lleva a cabo, puede contactar al Dr. Rick Scheidt, Comité de Investigación con la Participación de Seres Humanos, (785) 532-3224, 203 Fairchild Hall, Kansas State University, Manhattan, KS 66506. Muchas gracias por su tiempo y asistencia.

KANSAS STATE UNIVERSITY | Department of Hospitality Management

參與同意書

研究題目：獨立民族餐廳的自我報告食品安全行為：社會認知理論的應用

首席研究員：Kevin R. Roberts, Ph.D.
共同研究者：Basem A. Boutros, M.S.

I. 目的

本研究的目的是利用社會認知理論研究獨立民族餐廳的自我報告食品安全行為.

II. 程序

你的參與需要你參加小組面試. 您的參與需要您回答有關您餐廳食品安全行為的問題. 小組面試大約需要 60 分鐘才能完成. 小組成員將討論其中的問題. 堪薩斯州立大學機構審查委員會批准了這項研究.

III. 風險

沒有可識別的風險. 唯一預期的風險是回答問題可能造成的不便. 您不必回答任何讓您感到不舒服的問題，並且您可以隨時退出.

IV. 優點

你將有機會體驗和理解參與團體面試的過程. 這項研究的結果將為理論發展和實際干預提供一個框架，以更有效地針對有助於適當食品安全行為的因素.

V. 保密

研究人員將記錄小組面試. 錄音將被轉換為電腦音頻格式（MP3）並保存到受密碼保護的電腦中. 研究人員將抄錄這些信息並編寫一份報告. 沒有可識別的信息將與任何其他方或人分享，參與者可以選擇假名. 研究人員將記錄您對問題的回答，而不會將答案與最終報告中的人員聯繫起來. 收集的數據將被保存 3 年或直到研究發表，然後銷毀.

VI. 賠償金

您將獲得 20 美元現金作為您參與的評價.

VII. 退出

您的參與完全是自願的. 如果您決定不參加此研究，您可以隨時撤回您的同意。 您可以隨時停止參與，無需解釋，處罰或損失您的利益。

VIII. 參與者的許可

我確認下面的簽名表明我已閱讀並理解本同意書，並樂意同意按照所述條款參與本研究，並且我的簽名承認我已收到此同意書的簽名和日期副本.

參與者姓名： _____ **社會安全號碼：** _____

參與者簽名： _____ **今天的日期：** _____

研究員的簽名： _____ **今天的日期：** _____

如果您對研究有任何疑問，請聯繫 Basem Boutros 在 (785) xxx- xxxx 或 Kevin Roberts 在（785）532-2399. 如果您對本研究參與者的權利或其實施方式有任何疑問，請聯繫人類研究委員會主席 Rick Scheidt 博士，(785) 532-3224, 203 Fairchild Hall, Kansas State University, Manhattan, KS 66506. 非常感謝您的時間和協助.

Appendix E - Focus Group and Group Interview Demographic and Operational Information Questionnaire

Demographic and Operational Information

1. What is your age?

☐ 18 – 25 years
☐ 26 – 33 years
☐ 34 – 41 years
☐ 42 – 49 years
☐ 50 years and older

2. What is your gender?

☐ Male
☐ Female

3. What is your ethnicity?

☐ Caucasian
☐ Hispanic or Latino
☐ African American
☐ Native American
☐ Asian
☐ Pacific Islander
☐ Other, please specify_____

4. What is your highest level of education?

☐ Less than high school
☐ High school/GED
☐ Associate degree
☐ Some college
☐ Bachelor's degree
☐ Graduate degree

5. Which of the following most accurately describe your role?

☐ Line cook
☐ Prep cook
☐ Executive chef

6. How long have you been employed at your current position in foodservice?

☐ 5 years or less
☐ 6-15 years
☐ 16-25 years
☐ 26 years or more

7. How would you describe your operation?

☐ Independent
☐ Part of a chain
☐ Other, please specify_____

8. The theme of your restaurant is:

☐ Chinese
☐ Mexican
☐ Other, please specify_____

9. How would you classify your service?

☐ Quick service (Fast food)
☐ Quick casual
☐ Casual dining
☐ Fine dining
☐ Buffet

10. Have you received food safety training in the past year?

☐ Yes, please specify_____
☐ No

11. Do you have a current food safety certification?

☐ Yes, please specify_____
☐ No

Thank you!

Cuestionario de información demográfica y operacional

1. ¿Cuál es su edad?

☐ 18 – 25 años
☐ 26 – 33 años
☐ 34 – 41 años
☐ 42 – 49 años
☐ 50 años o más

2. ¿Cuál es su género?

☐ Masculino
☐ Femenino

3. ¿Cuál es su grupo étnico?

☐ Caucásico
☐ Hispano o latino
☐ Afroamericano
☐ Nativo Americano
☐ Asiático
☐ Islas del Pacífico
☐ Otro, por favor especifique_____

4. ¿Cuál es el nivel más alto de educación?

☐ Educación Primaria
☐ Educación secundaria / GED
☐ Grado Asociado
☐ Algo de universidad
☐ Bachillerato
☐ Posgrado

5. ¿Cuál es su puesto?

☐ Cocinero de línea
☐ Cocinero de preparación
☐ Chef ejecutivo

6. ¿Cuánto tiempo ha estado trabajando en su puesto actual en el servicio de alimentación?

☐ 5 años o menos
☐ 6-15 años
☐ 16-25 años
☐ 26 años o más

7. ¿Cómo describiría su operación?
☐ Independiente
☐ Parte de una cadena
☐ Otro, por favor especifique _____

8. El tema de su restaurante es:
☐ Chino
☐ Mexicano
☐ Otro, por favor especifique _____

9. ¿Cómo clasificaría el tipo de servicio?

☐ Servicio rápido (comida rápida)
☐ Informal rápido
☐ Cena casual
☐ Cena formal
☐ Buffet

10. ¿Ha recibido capacitación en inocuidad de los alimentos en el año pasado?

☐ Sí, por favor especifique_____
☐ No

11. ¿Tiene usted certificación en inocuidad de los alimentos?

☐ Sí, por favor especifique _____
☐ No

¡Gracias!

人口統計問卷

1. 年龄？

☐ 18 - 25 年
☐ 26 – 33 年
☐ 34 – 41 年
☐ 42 – 49 年
☐ 50 歲以上

2. 性别?

☐男
☐女

3. 你的種族背景是什麼？

☐ 白人
☐ 西班牙裔或拉丁裔
☐ 非裔美國人
☐ 美洲原住民
☐ 亚洲人的
☐ 太平洋岛民
☐ 其他請註明_____

4. 下面哪项是您的最高学历？

☐低于高中
☐高中
☐社区大学
☐联合学位
☐大學學歷
☐研究生學位

5. 以下哪項描述你的角色？

☐ 廚師
☐ 厨师准备
☐ 廚師長

6. 您在餐饮业干了多久？

☐ 5 年或更少
☐ 6-15 年
☐ 16-25 年
☐ 26 年或更长时间

7. 你如何描述你的餐廳？

☐ 獨立
☐ 连锁店的一部分
☐ 其他請註明_____

8. 你餐廳的主題是：

☐ 中餐
☐ 墨西哥
☐其他請註明 _____

9. 你如何分類你的服務？

☐ 快餐
☐ 快速休閒餐飲
☐ 休闲餐饮
☐ 高级餐厅等
☐ 自助餐

10. 您以前有没有参加过食品安全培训？

☐是的，請說明 _____
☐ 没有

11. 你有食品安全認證嗎？

☐是的，請說明 _____
☐ 没有

非常感谢您的参与！

Appendix F - Survey Instrument

KANSAS STATE UNIVERSITY | Department of Hospitality Management

Dear Food Handler,

Do you know that one in six Americans is exposed to foodborne illnesses each year in the U.S.? Approximately 60% of the reported foodborne illness outbreaks are linked to ethnic food, originated in restaurants. To meet the needs of independent ethnic restaurants, I am conducting a study to understand factors that influence food safety behavior. The results of this study target factors that will lead to positive food safety practices.

You are invited to participate in this study. Please be assured that your responses will be confidential, and all data will be reported as group data. As a token of appreciation for your participation, you will receive $5 cash.

This questionnaire will take 10-15 minutes to complete. Please carefully read each question and do not leave any item blank. Your participation is voluntary, refusal to participate will involve no penalty, and you may discontinue participation at any time without penalty. Individual responses will be completely anonymous.

Your response is very important to the success of this study. We greatly appreciate your time and assistance.

Should you have any questions about the study, please contact Basem Boutros at (xxx) xxx- xxxx or Dr. Kevin Roberts at (785) 532- 2399. If you have any questions about the rights of individuals in this study or about the way it is conducted, you may contact Dr. Rick Scheidt, Chair of the Committee on Research Involving Human Subjects, (785) 532-3224, 203 Fairchild Hall, Kansas State University, Manhattan, KS 66506. Thank you so much for your time and assistance.

Cordially,

Basem Boutros

Basem A. Boutros, M.S.
Doctoral Candidate

K. R. Roberts

Kevin R. Roberts, Ph.D.
Associate Professor

152 Justin Hall, 1324 Lovers Lane, Manhattan, KS 66506-1404 | 785-532-5521 | Fax: 785-532-5522

Part I: For each statement below, please rate how confident you are that ***you could perform*** the following food safety practices.

	Can't do at all	Can do a little	Can do some	Can do mostly	Can do for sure
1. Correctly use a thermometer to determine if food is cooked to a safe temperature.	1	2	3	4	5
2. Clean and sanitize food contact surfaces before and after preparing food.	1	2	3	4	5
3. Wash my hands with soap and water for 20 seconds before I begin to prepare food.	1	2	3	4	5
4. Constantly prepare food in a sanitary manner, even when I am busy with other tasks.	1	2	3	4	5
5. Perform proper food handling practices to prevent cross-contamination.	1	2	3	4	5
6. Wash my hands before putting on or changing gloves.	1	2	3	4	5
7. Wash my hands when food preparation tasks are interrupted or changed.	1	2	3	4	5
8. Wash my hands after using the restroom, coughing, sneezing, smoking, or touching body parts.	1	2	3	4	5
9. Use the thermometer to ensure proper food holding temperature.	1	2	3	4	5
10. Use the thermometer at the completion of reheating food to 165°F.	1	2	3	4	5

Part II: Please indicate your ***level of agreement*** with each of the following statements by circling the corresponding number.

	Strongly disagree	**Disagree**	**Undecided**	**Agree**	**Strongly agree**
11. I closely monitor my handwashing practices during my shift.	1	2	3	4	5
12. I always evaluate my own handling practices of food and work surfaces.	1	2	3	4	5
13. I monitor my thermometer use practices to ensure food safety.	1	2	3	4	5
14. I evaluate my handwashing practices to ensure I follow the proper steps.	1	2	3	4	5
15. I wash my hands with a goal to ensure food safety.	1	2	3	4	5
16. I monitor my own handling practices of food and work surfaces.	1	2	3	4	5
17. I always set a goal to ensure food safety when handling food and work surfaces.	1	2	3	4	5
18. I evaluate myself when I use a food thermometer.	1	2	3	4	5
19. I have a goal to ensure food has reached a safe temperature for service and consumption.	1	2	3	4	5
20. Facilities are adequately equipped to follow safe food handling practices.	1	2	3	4	5
21. Sufficient financial resources are provided to support hygiene and food safety.	1	2	3	4	5
22. I get sufficient time to work in a hygienic and safe food way.	1	2	3	4	5
23. Procedures and instructions concerning food safety are provided to me.	1	2	3	4	5

24. The necessary infrastructure and equipment (e.g., hand washing sinks) are available and accessible to support food safety.	1	2	3	4	5
25. My manager/supervisor enforces food safety rules consistently with employees.	1	2	3	4	5
26. My manager/supervisor inspires me to follow proper food safety practices.	1	2	3	4	5
27. My coworkers are always supportive of each other regarding food safety.	1	2	3	4	5
28. My manager/supervisor is actively involved to ensure safe food handling is practiced.	1	2	3	4	5
29. Sufficient education and food safety training are provided.	1	2	3	4	5
30. I intend to use a food thermometer at the completion of cooking.	1	2	3	4	5
31. I plan to wash my hands whenever it is required.	1	2	3	4	5
32. I am willing to clean and sanitize food contact surfaces between each use.	1	2	3	4	5
33. I plan to use a food thermometer at the completion of reheating food.	1	2	3	4	5
34. I intend to use a food thermometer to check the temperature on the hot line/cold line.	1	2	3	4	5
35. I am willing to separate raw food from ready-to-eat food during preparation.	1	2	3	4	5

Part III: Using the stem "*If I follow proper food safety practices regarding handwashing, use of thermometer, and handling of food and work surfaces* _____", please circle your response to each of the following statement.

If I follow proper food safety practices regarding handwashing, use of thermometer, and handling of food and work surfaces:	**Very unlikely**	**Unlikely**	**Somewhat likely**	**Likely**	**Very likely**
36. I will help protect my restaurant from liability for foodborne illnesses.	1	2	3	4	5
37. my manager/supervisor will praise my performance.	1	2	3	4	5
38. I will not be able to focus on primary tasks of preparation and cooking.	1	2	3	4	5
39. customers will be satisfied.	1	2	3	4	5
40. I will reduce the risk of foodborne illnesses.	1	2	3	4	5
41. I will feel a sense of accomplishment.	1	2	3	4	5
42. I will help protect the reputation of my restaurant.	1	2	3	4	5
43. I will avoid losing my job.	1	2	3	4	5

Part IV: Please indicate ***how often you perform*** the following food safety behaviors by circling the corresponding number.

	Never	**Rarely**	**Sometimes**	**Often**	**Always**
44. I wash my hands when starting shift.	1	2	3	4	5
45. I wash my hands before putting on or changing gloves.	1	2	3	4	5
46. I wash my hands after sneezing, coughing, or using a tissue.	1	2	3	4	5
47. I wash my hands before and after handling raw food.	1	2	3	4	5

48. I wash my hands after touching anything that may contaminate hands (chemicals, non-sanitized work surfaces, body parts).	1	2	3	4	5
49. I wash, rinse, and sanitize food contact surfaces between working with different types of food or ingredients.	1	2	3	4	5
50. I cover and label food properly before storing or holding.	1	2	3	4	5
51. I separate raw products from ready-to-eat products when preparing food.	1	2	3	4	5
52. I check the internal temperature of food by inserting the thermometer's probe into the thickest part of the product.	1	2	3	4	5
53. I use a thermometer to check the temperature of food at the completion of cooking.	1	2	3	4	5
54. I use a thermometer to check the temperature of food at the completion of reheating.	1	2	3	4	5
55. I use a thermometer to ensure that hot food is held at 135°F or higher and cold food is held at 41°F or less.	1	2	3	4	5

Part V: Demographic and Operational Information
Please answer the following questions about you and the operation in which you work.

56. What is your age?

_____ years

57. What is your gender?

A. Male
B. Female

58. What is your ethnicity?

A. Caucasian
B. Hispanic or Latino
C. African American
D. Native American
E. Asian
F. Pacific Islander
G. Other, please specify_____

59. What is your highest level of education?

A. Less than high school
B. High school/GED
C. Associate degree
D. Some college
E. Bachelor's degree
F. Graduate degree

60. Which of the following most accurately describes your role?

A. Line cook
B. Prep cook
C. Executive chef
D. Other, please specify: _____

61. How long have you been employed in foodservice?

A. 5 years or less
B. 6-15 years
C. 16-25 years
D. 26 years or more

62. How would you describe your operation?

A. Independent
B. Part of a chain
C. Other, please specify:

_____

63. The theme of your restaurant is:

A. Chinese
B. Mexican
C. Other, please specify:

_____

64. How would you classify your service?

A. Quick service (Fast food)
B. Quick casual
C. Casual dining
D. Fine dining
E. Buffet

65. Have you received food safety training in the past year?

A. Yes
B. No

66. Do you have a current food safety certification?

A. Yes, please specify:_____
B. No

Thank you!

KANSAS STATE UNIVERSITY | Department of Hospitality Management

Estimado manipulador de alimentos,

¿Sabe usted que uno de cada seis estadounidenses está expuesto a enfermedades transmitidas por los alimentos cada año en los Estados Unidos? Aproximadamente el 60% de los brotes de enfermedades transmitidas por los alimentos están relacionados con alimentos étnicos, originados en restaurantes. Para satisfacer las necesidades de restaurantes étnicos independientes, estoy llevando a cabo un estudio para comprender los factores que influyen en el comportamiento de seguridad alimentaria (Food Safety). Los resultados de este estudio se enfocan en factores que conducirán a prácticas positivas de inocuidad de los alimentos.

Usted está invitado a participar en este estudio. Tenga la seguridad de que sus respuestas serán confidenciales y que todos los datos serán reportados como datos grupales. Como muestra de agradecimiento por su participación, recibirá $5 en efectivo.

Este cuestionario tardará de 10 a 15 minutos en completarse. Lea cuidadosamente cada pregunta y no deje ningún espacio en blanco. Su participación es voluntaria, el no participar no conllevará ninguna penalización, y usted puede cancelar la participación en cualquier momento sin penalización. Las respuestas individuales serán completamente anónimas.

Su respuesta es muy importante para el éxito de este estudio. Agradecemos mucho su tiempo y asistencia.

Si tiene alguna pregunta sobre el estudio, comuníquese con Basem Boutros al (xxx) xxx-xxxx o con el Dr. Kevin Roberts al (785) 532-2399. Si tiene alguna pregunta sobre los derechos de las personas en este estudio o la forma en que se lleva a cabo, puede contactar al Dr. Rick Scheidt, Comité de Investigación con la Participación de Seres Humanos, (785) 532-3224, 203 Fairchild Hall, Kansas State University, Manhattan, KS 66506. Muchas gracias por su tiempo y asistencia.

Cordialmente,

Basem Boutros

Basem A. Boutros, M.S.
Candidato a Doctorado

K. R. Roberts

Kevin R. Roberts, Ph.D.
Profesor Asociado

152 Justin Hall, 1324 Lovers Lane, Manhattan, KS 66506-1404 | 785-532-5521 | Fax: 785-532-5522

Parte I: Para cada declaración a continuación, indique qué tan seguro está de que podría realizar las siguientes prácticas de inocuidad de los alimentos. ***Inocuidad de los alimentos se refiere a food safety.***

	No lo puede hacer del todo	**Lo puede hacer un poco**	**Puede hacer algo**	**Lo puede hacer en su mayoría**	**Con seguridad lo puede hacer**
1. Utilizar correctamente un termómetro para determinar si los alimentos están cocidos a una temperatura segura.	1	2	3	4	5
2. Limpiar y desinfectar las superficies que entran en contacto con los alimentos antes y después de preparar los alimentos.	1	2	3	4	5
3. Lavarse las manos con agua y jabón durante 20 segundos antes de comenzar a preparar los alimentos.	1	2	3	4	5
4. Preparar constantemente los alimentos de manera higiénica, incluso cuando estoy ocupado con otras tareas.	1	2	3	4	5
5. Realizar las prácticas adecuadas de manipulación de los alimentos para evitar la contaminación cruzada.	1	2	3	4	5
6. Lavarse las manos antes de ponerse o cambiarse los guantes.	1	2	3	4	5
7. Lavarse las manos cuando las tareas de preparación de alimentos se interrumpen o cambien.	1	2	3	4	5

8. Lavarse las manos después de usar el baño, toser, estornudar, fumar o tocar partes del cuerpo.	1	2	3	4	5
9. Utilizar el termómetro para asegurar la temperatura adecuada de mantenimiento de los alimentos.	1	2	3	4	5
10. Utilizar el termómetro cuando termine de recalentar los alimentos a 165°F.	1	2	3	4	5

Parte II: Indique su nivel de acuerdo con cada una de las siguientes declaraciones al marcar con un circulo el número correspondiente.

	Muy en desacuerdo	**En desacuerdo**	**Indeciso**	**De acuerdo**	**Totalmente de acuerdo**
11. Superviso de cerca mis prácticas de lavado de manos durante mi turno.	1	2	3	4	5
12. Siempre evalúo mis propias prácticas de manejo de los alimentos y superficies de trabajo.	1	2	3	4	5
13. Superviso las prácticas de uso del termómetro para garantizar la inocuidad de los alimentos.	1	2	3	4	5
14. Evalúo mis prácticas de lavado de manos para asegurarme de seguir los pasos adecuados.	1	2	3	4	5
15. Me lavo las manos con el objetivo de garantizar la inocuidad de los alimentos.	1	2	3	4	5

16. Superviso mis propias prácticas de manejo de los alimentos y superficies de trabajo.	1	2	3	4	5
17. Siempre me he marcado una meta para garantizar la inocuidad de los alimentos cuando manipulo alimentos y superficies de trabajo.	1	2	3	4	5
18. Me evalúo cuando uso un termómetro para alimentos.	1	2	3	4	5
19. Tengo la meta de garantizar que los alimentos alcancen una temperatura segura para el servicio y el consumo.	1	2	3	4	5
20. Las instalaciones están equipadas adecuadamente para seguir prácticas seguras de manipulación de los alimentos.	1	2	3	4	5
21. Se proporcionan recursos financieros suficientes para apoyar la higiene y la inocuidad de los alimentos.	1	2	3	4	5
22. Tengo suficiente tiempo para trabajar de forma higiénica y segura.	1	2	3	4	5
23. Se me proporcionan los procedimientos e instrucciones sobre la inocuidad de los alimentos.	1	2	3	4	5
24. La infraestructura y el equipo necesarios (por ejemplo, lavatorios para lavarse las manos) están disponibles y son accesibles para apoyar la	1	2	3	4	5

inocuidad de los alimentos.					
25. Mi gerente / supervisor hace cumplir las reglas de inocuidad de los alimentos consistentemente con los empleados.	1	2	3	4	5
26. Mi gerente / supervisor me inspira a seguir prácticas adecuadas de inocuidad de los alimentos.	1	2	3	4	5
27. Mis compañeros de trabajo siempre se apoyan el uno al otro con respecto a la inocuidad de los alimentos.	1	2	3	4	5
28. Mi gerente / supervisor participa activamente para garantizar la manipulación segura de los alimentos.	1	2	3	4	5
29. Se proporciona suficiente capacitación y educación sobre la inocuidad de los alimentos.	1	2	3	4	5
30. Tengo la intención de usar un termómetro de alimentos al finalizar la cocción.	1	2	3	4	5
31. Planeo lavarme las manos cuando sea necesario.	1	2	3	4	5
32. Estoy dispuesto a limpiar y desinfectar las superficies de contacto con los alimentos entre cada uso.	1	2	3	4	5

33. Planeo usar un termómetro para alimentos cuando termine de recalentar los alimentos.	1	2	3	4	5
34. Tengo la intención de usar un termómetro de alimentos para revisar la temperatura en la línea caliente / línea fría.	1	2	3	4	5
35. Estoy dispuesto a separar los alimentos crudos de los alimentos listos para el consumo durante la preparación.	1	2	3	4	5

Parte III: Utilizando la siguiente frase, "Si sigo las prácticas adecuadas de inocuidad de los alimentos con respecto al lavado de manos, el uso del termómetro y el manejo de alimentos y superficies de trabajo _____", marque con un círculo su respuesta a cada una de las siguientes afirmaciones.

Si sigo las prácticas adecuadas de inocuidad de los alimentos con respecto al lavado de manos, el uso del termómetro y el manejo de alimentos y superficies de trabajo:	**Muy poco probable**	**Improbable**	**Algo probable**	**Probable**	**Muy probable**
36. Ayudaré a proteger a mi restaurante de la responsabilidad por enfermedades transmitidas por los alimentos.	1	2	3	4	5
37. Mi gerente / supervisor elogiará mi desempeño.	1	2	3	4	5
38. No podré concentrarme en las tareas principales de preparación y cocción.	1	2	3	4	5
39. Los clientes estarán satisfechos.	1	2	3	4	5

40. Reduciré el riesgo de enfermedades transmitidas por los alimentos.	1	2	3	4	5
41. Tendré una sensación de logro.	1	2	3	4	5
42. Ayudaré a proteger la reputación de mi restaurante.	1	2	3	4	5
43. Evitaré perder mi trabajo.	1	2	3	4	5

Parte IV: Indique ***con qué frecuencia*** realiza los siguientes comportamientos de inocuidad por poner un círculo alrededor del número correspondiente.

	Nunca	**Raramente**	**A veces**	**A menudo**	**Siempre**
44. Me lavo las manos cuando empiezo el turno.	1	2	3	4	5
45. Me lavo las manos antes de ponerme o cambiarme los guantes.	1	2	3	4	5
46. Me lavo las manos después de estornudar, toser o usar un pañuelo.	1	2	3	4	5
47. Me lavo las manos antes y después de manipular alimentos crudos.	1	2	3	4	5
48. Me lavo las manos después de tocar cualquier cosa que pueda contaminar las manos (productos químicos, superficies de trabajo no desinfectadas, partes del cuerpo).	1	2	3	4	5
49. Lavo, enjuago y desinfecto las superficies que entran en contacto con los alimentos luego de trabajar con diferentes tipos de alimentos o ingredientes.	1	2	3	4	5
50. Cubro y etiqueto los alimentos correctamente antes de guardarlos o mantenerlos en su sitio.	1	2	3	4	5
51. Separo los productos crudos de los productos listos para el consumo cuando preparo los alimentos.	1	2	3	4	5

52. Reviso la temperatura interna de los alimentos insertando la sonda del termómetro en la parte más gruesa del producto.	1	2	3	4	5
53. Utilizo un termómetro para revisar la temperatura de los alimentos al finalizar la cocción.	1	2	3	4	5
54. Utilizo un termómetro para revisar la temperatura de los alimentos al finalizar el recalentamiento.	1	2	3	4	5
55. Utilizo un termómetro para asegurar que la comida caliente se mantenga a 135°F o más y que la comida fría se mantenga a 41°F o menos.	1	2	3	4	5

Parte V: Información demográfica y operacional
Responda las siguientes preguntas sobre usted y la operación en la que trabaja.

56. ¿Cuál es su edad?

_____ Años

57. ¿Cuál es su género?

A. Masculino
B. Femenino

58. ¿Cuál es su grupo étnico?

A. Caucásico
B. Hispano o latino
C. Afroamericano
D. Nativo Americano
E. Asiático
F. Islas del Pacífico
G. Otro, por favor especifique:_____

59. ¿Cuál es el nivel más alto de educación?

A. Educación primaria
B. Educación secundaria / GED
C. Grado Asociado
D. Algunas clases universitarias
E. Bachillerato
F. Posgrado

60. ¿Cuál es su puesto?

A. Cocinero de línea
B. Cocinero de preparación
C. Chef ejecutivo
D. Otro, por favor especifique:_____

61. ¿Cuánto tiempo ha estado trabajando en el servicio de alimentación?

A. 5 años o menos
B. 6-15 años
C. 16-25 años
D. 26 años o más

62. ¿Cómo describiría su operación?

A. Independiente
B. Parte de una cadena
C. Otro, por favor especifique:

_____

63. El tema de su restaurante es:

A. Chino
B. Mexicano
C. Otro, por favor especifique:

_____

64. ¿Cómo clasificaría el tipo de servicio?

A. Servicio rápido (comida rápida)
B. Informal rápido
C. Cena casual
D. Cena formal
E. Buffet

65. ¿Ha recibido capacitación en inocuidad de los alimentos en el año pasado?

A. Sí,
B. No

66. ¿Tiene usted certificación en inocuidad de los alimentos?

A. Sí, por favor especifique: _____
B. No

¡Gracias!

KANSAS STATE UNIVERSITY | Department of Hospitality Management

尊敬的食品管理者，

您知道吗?在美国，每年有六分之一的美国人面临食源性疾病。据报道，大约60%的食源性疾病暴发与民族风味餐有关，并起源于餐馆。为了满足独立经营的民族餐馆的需要，我正在进行一项关于了解影响食品安全行为因素的研究。本研究的结果将会促进食品安全措施向更积极的方向发展。

您被邀请参与这项研究。请放心，您的调查反馈将会被保密，所有的数据将作为数据组进行使用。您将收到 5 美元的现金，以表示对您参与此次问卷的感谢。

这份问卷将花费 10-15 分钟完成。请仔细阅读每一个问题，不要留下任何空白。您的参与是自愿的，拒绝参与将不会受到惩罚，您可以在任何时候停止参与且不受任何处罚。个人的调查反馈将是被完全匿名的。

您的反馈对这项研究的成功非常重要。我们非常感谢您的时间和帮助。

如果您对这项研究有任何疑问，请致电 Basem Boutros：(xxx) xxx-xxxx 或 Kevin Roberts 博士：(785) 532- 2399。如果您对本次研究中关于个人权利有任何疑问，或者您对该研究的方式有任何疑问，您可以联系人类受试者研究委员会主席 Rick Scheidt 博士：(785) 532-3224, 203 Fairchild Hall, Kansas State University, Manhattan, KS 66506。非常感谢您的时间和帮助。诚挚地，

Basem Boutros

Basem A. Boutros, M.S.
博士研究生

Kevin R. Roberts, Ph.D.
副教授

152 Justin Hall, 1324 Lovers Lane, Manhattan, KS 66506-1404 | 785-532-5521 | Fax: 785-532-5522

第一部分: 请阅读下面的每句话，并对您***执行***下列食品安全措施的信心进行评估。

	完全不会做	可以做一点	可以做一些	可以做大多数	一定会做
1. 正确使用温度计来判断食物是否烹饪到安全的温度。	1	2	3	4	5
2. 在准备食物之前和之后对食物接触表面进行清洗和消毒。	1	2	3	4	5
3. 在开始准备食物之前，用肥皂和水洗手 20 秒钟。	1	2	3	4	5
4. 坚持用卫生的方式准备食物，即使是在我忙于其他任务的时候。	1	2	3	4	5
5. 使用适当的食物处理措施以防止交叉污染。	1	2	3	4	5
6. 戴上或换手套之前要洗手。	1	2	3	4	5
7. 当食物准备工作被打断或改变时，请洗手。	1	2	3	4	5
8. 在使用完洗手间、咳嗽、打喷嚏、吸烟或接触身体部位后洗手。	1	2	3	4	5
9. 使用温度计确保相对的食物保温。	1	2	3	4	5
10. 重新加热食物时，使用温度计使温度达到 165°F。	1	2	3	4	5

第二部分: 请用相应的数字来表示您的*同意程度*。

	完全不同意	不同意	不确定	同意	完全同意
11. 我在换班期间密切留意我的洗手习惯。	1	2	3	4	5
12. 我经常对自己处理食物和食物接触表面的做法进行评估。	1	2	3	4	5
13. 我关注我的温度计使用方法以确保食品安全。	1	2	3	4	5
14. 我留意我的洗手习惯，以确保我遵循正确的步骤。	1	2	3	4	5
15. 我洗手的目的是为了确保食品安全。	1	2	3	4	5
16. 我监督自己处理食物和食物接触表面的方法。	1	2	3	4	5
17. 在处理食物和食物接触表面时我总是设定一个目标，以确保食品安全。	1	2	3	4	5
18. 当我使用食物温度计时，我会自我评价。	1	2	3	4	5
19. 我的目标是确保食品在提供和出售时达到安全的温度。	1	2	3	4	5
20. 有完备的设施来执行安全的食品处理方法。	1	2	3	4	5
21. 提供足够的财政资源以支持卫生和食品安全。	1	2	3	4	5
22. 我有足够的时间来用卫生和安全的方式工作。	1	2	3	4	5
23. 已提供给我关于食品安全的程序和说明。	1	2	3	4	5
24. 必要的基础设施和设备(例如洗手池)是可用的，并可用于支持食品安全。	1	2	3	4	5

25. 我的经理/主管总是和员工一起执行食品安全规则。	1	2	3	4	5
26. 我的经理/主管鼓励我遵循相应的食品安全措施。	1	2	3	4	5
27. 在食品安全方面，我的同事们总是互相支持。	1	2	3	4	5
28. 我的经理/主管积极参与并确保食品处理工作是安全的。	1	2	3	4	5
29. 提供足够的教育和食品安全培训。	1	2	3	4	5
30. 我打算在烹饪结束时使用食物温度计。	1	2	3	4	5
31. 我打算在需要的时候洗手。	1	2	3	4	5
32. 我愿意在每次使用食物接触表面之前对其进行清洗和消毒。	1	2	3	4	5
33. 我计划在重新加热食物的时候使用食物温度计。	1	2	3	4	5
34. 我打算用一个食品温度计来核查热的食物/冷的食物的温度。	1	2	3	4	5
35. 我愿意在准备期间将生食与即食食品分开。	1	2	3	4	5

第三部分: 将“如果我遵守有关洗手、使用温度计和处理食物和食物接触表面的食品安全措施”作为前提，请在以下问题中圈出你的回复。

如果我遵守有关洗手、使用温度计和处理食物和食物接触表面的食品安全措施	**完全不可能**	**不可能**	**有可能**	**可能**	**非常可能**
36. 我将帮助保护我的餐馆免于承担食源性疾病的责任。	1	2	3	4	5
37. 我的经理/主管会赞扬我的表现。	1	2	3	4	5
38. 我将不能专心承担准备和烹饪的任务。	1	2	3	4	5

39. 顾客会感到满意。	1	2	3	4	5
40. 我将减少发生食源性疾病的风险。	1	2	3	4	5
41. 我会有一种成就感。	1	2	3	4	5
42. 我会帮助保护我的餐厅的声誉。	1	2	3	4	5
43. 我会避免丢掉工作。	1	2	3	4	5

第四部分: 请通过圈出相应的数字来说 明你执行下列食品安全行为的***频率***。

	从不	很少	有时	经常	总是
44. 当换班的时候，我会洗手。	1	2	3	4	5
45. 在戴上手套或换手套之前，我会洗手。	1	2	3	4	5
46. 我在打喷嚏、咳嗽或使用纸巾后洗手。	1	2	3	4	5
47. 我在处理生食前后洗手。	1	2	3	4	5
48. 在接触任何可能污染手的东西(化学品、非消毒的接触表面、身体部位)后，我会洗手。	1	2	3	4	5
49. 在使用不同的食物或配料之间，我会清洗，冲洗，和消毒食品接触表面。	1	2	3	4	5
50. 在储存或保存之前，我先把食物盖好并贴上标签。	1	2	3	4	5
51. 我在准备食物的时候，会把生食和即食食品分开。	1	2	3	4	5
52. 我通过把温度计的探针插入食物最厚的部分来检查食物的内部温度。	1	2	3	4	5
53. 在烹饪结束时，我用温度计检查食物的温度。	1	2	3	4	5
54. 在重新加热时，我用温度计来检查食物的温度。	1	2	3	4	5

55. 我用温度计确保热的食物保持在 135°F 或以上且冷的食物保持在 41°F 或以下。	1	2	3	4	5

第五部分: 个人统计和操作信息
请就以下关于您和您的工作相关问题进行回答。

56. 您的年龄是多少?

_____ 岁

57. 您的性别是什么?

A. 男
B. 女

58. 您的民族是什么?

A. 白种人
B. 西班牙裔或拉丁裔
C. 非洲裔美国人
D. 美洲原住人
E. 亚洲人
F. 太平洋岛人
G. 其他, 请具体说明：_____

59. 您的最高学历是什么?

A. 高中以下
B. 高中/高中同等学历
C. 大专
D. 大学（学院）
E. 本科
F. 硕士

60. 以下哪一个最能准确地描述您的工作?

A. 上线厨师
B. 助理厨师
C. 行政总厨
D. 其他, 请具体说明 ： _____

61. 您在餐饮业工作多久了?

A. 5 年以下
B. 6-15 年
C. 16-25 年
D. 26 年以上

62. 您怎样描述您的经营现状?

A. 独立经营
B. 产业链的一部分
C. 其他, 请具体说明: _____

63. 您餐馆的主题是什么:

A. 中餐
B. 墨西哥菜
C. 其他, 请具体说明: _____

64. 您将您能提供的服务划为哪一类?

A. 快速服务(快餐)
B. 快速休闲餐
C. 休闲餐饮
D. 正式餐厅
E. 自助餐

65. 在过去的一年中您参加过食品安全训练吗?

A. 参加过
B. 没参加过

66. 您目前有食品安全认证吗?

A. 有, 请具体说明: _____
B. 没有

谢谢您!

Appendix G - Evaluative Questions Used in the Pilot Test of the Survey Instrument

Questionnaire and Content Clarity

Please provide any insight you have concerning the content or clarity of the questions asked

1. **Did any of the questions have content you did not understand?**

A. No
B. Yes: Please specify: _____

_____

_____

2. **Were any of the questions unclear to you?**

A. No
B. Yes: How would you improve the question?

_____

_____

_____

3. **Was any part of this questionnaire not applicable to your restaurant?**

A. No
B. Yes: Please specify: _____

_____

_____

_____

4. **Do you have any suggestions on improving this questionnaire before administering it to other food handlers?**

A. No
B. Yes: Please specify:

_____

_____

_____

_____

Thank you!

Cuestionario y claridad de contenido

Proporcione cualquier información que tenga sobre el contenido o la claridad de las preguntas formuladas

1. **¿Alguna de las preguntas tiene contenido que no entendiste?**

A. No
B. Sí: por favor especifique: _____

_____

_____

_____

2. **¿Alguna de las preguntas le resultó poco clara?**

A. No
B. Sí: ¿cómo mejorarías la pregunta?

_____

_____

_____

3. **¿Alguna parte de este cuestionario no se aplica a su restaurante?**

A. No
B. Sí: por favor especifique: _____

_____

_____

_____

4. **¿Tiene alguna sugerencia para mejorar este cuestionario antes de administrarlo a otros manipuladores de alimentos?**

A. No
B. Sí: por favor especifique: _____

_____

_____

_____

¡Gracias!

第六部分: 问卷调查和内容清晰度调查

请您对所提问题的内容或清晰度提出一些见解。

1. 有任何问题或其内容使您困惑吗?

A. 没有
B. 有: 请具体说明: _____

_____

_____

2. 有任何您不明白的问题吗?

A. 没有
B. 有: 您怎样修改或润色这个问题?

_____

_____

_____

3. 问卷的任何部分有不适用于您餐厅的吗?

A. 没有
B. 有: 请具体说明: _____

_____

_____

_____

4. 在分发给其他食物操作者之前，对这份问卷的改善您是否有任何建议?

A. 没有
B. 有: 请具体说明: _____

_____

_____

_____

谢谢您!

Appendix H - IRB Approval

KANSAS STATE UNIVERSITY | University Research Compliance Office

TO: Kevin Roberts
Hospitality Management
Justin Hall

Proposal Number: 9170

FROM: Rick Scheidt, Chair
Committee on Research Involving Human Subjects

DATE: 02/23/2018

RE: Proposal Entitled, "Self-reported Food Safety Behavior in Independent Ethnic Restaurants: An Application of the Social Cognitive Theory"

The Committee on Research Involving Human Subjects / Institutional Review Board (IRB) for Kansas State University has reviewed the proposal identified above and has determined that it is EXEMPT from further IRB review. This exemption applies only to the proposal - as written – and currently on file with the IRB. Any change potentially affecting human subjects must be approved by the IRB prior to implementation and may disqualify the proposal from exemption.

Based upon information provided to the IRB, this activity is exempt under the criteria set forth in the Federal Policy for the Protection of Human Subjects, **45 CFR §46.101, paragraph b, category: #2, subsection: ii.**

Certain research is exempt from the requirements of HHS/OHRP regulations. A determination that research is exempt does not imply that investigators have no ethical responsibilities to subjects in such research; it means only that the regulatory requirements related to IRB review, informed consent, and assurance of compliance do not apply to the research.

Any unanticipated problems involving risk to subjects or to others must be reported immediately to the Chair of the Committee on Research Involving Human Subjects, the University Research Compliance Office, and if the subjects are KSU students, to the Director of the Student Health Center.

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comply@k-state.edu | k-state.edu/research/comply